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ABSTRACT

Instructional units with suggested resources and appropriate activities for teaching environmental design to students in grades 6-12 are presented. An overview of program goals and suggested environmental awareness exercises and projects is followed by six illustrative units. The first unit (grade 6) focuses on environmental awareness and recreational environments, specifically the playground. In the second unit (grade 7), students consider amusement parks as a recreational environment, single space shelter as a form of architecture, and graphics in the community environment. The third unit (grade 8) introduces social needs and "street furniture" as part of the community environment and uses gardens to illustrate a human-made recreational environment. The fourth unit, fundamentals of art, introduces students to architecture and natural forms, recreation parks, and public monuments and architectural preservation as a part of the historical environment. The fifth unit, "Commercial Art I," presents sections on residential architecture, modular design, and architecture and climate. Lessons in the sixth and final section, "Commercial Art II," examine interior and industrial design, urban planning, and cities of the future. Appendices include sample matrices, an urban food shopping activity, a city/county planning survey, an architectural element chart, a market research survey, a basic structure chart, and a map. An annotated bibliography of over 120 teacher and student resources, pamphlets, and journal articles published between 1960 and 1980 concludes the document. (LH)

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ENVIRONMENTAL DESIGN

Instructional Guide and Resource for Elementary and Secondary School Use

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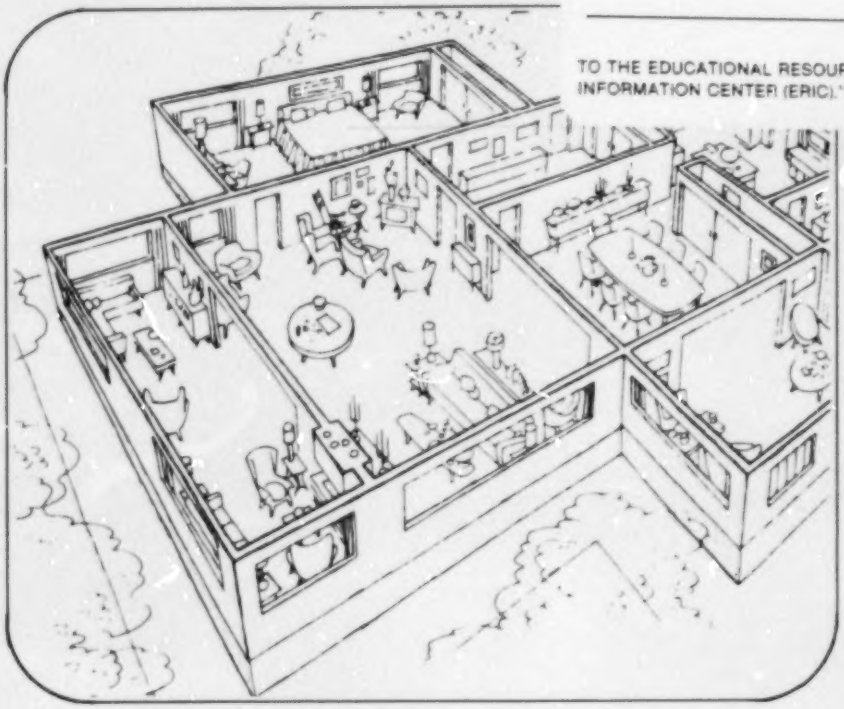

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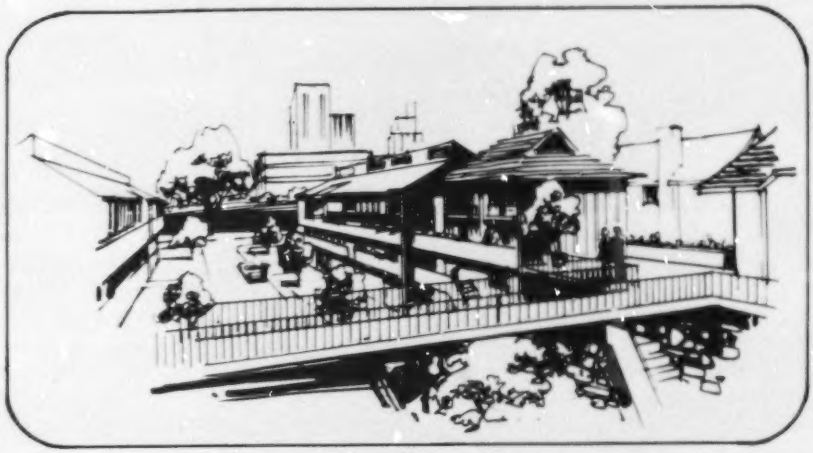

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Montgomery County Public Schools • Rockville, Maryland

Environmental Design

Instructional Resource Guide Grades 6-12

Montgomery County Public Schools
Rockville, Maryland
Spring 1982

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Rockville, Maryland

Table of Contents

Introduction v

Acknowledgments v

Overview vii

Environmental Awareness Exercises and Projects ix

Illustrative Units xiii

Units

Grade 6

Environmental Awareness 2

Recreational Environments — Playground 3

Grade 7

Recreational Environments — Amusement Parks 6

Architecture — Single Space Shelter 7

Community Environment — Graphics 8

Grade 8

Community Environment — Social Needs 10

Community Environment — Street Furniture 11

Recreational Environments — Gardens 12

Fundamentals of Art

Architecture and Natural Forms 14

Recreational Environments — Recreation Parks 15

Historical Environments — Public Monuments 17

Historical Environments — Architectural Preservation 18

Commercial Art I

Architecture — Residential 20

Architecture — Modular Design 21

Architecture and Climate 22

Commercial Art II

Interior and Industrial Design 26

Urban Planning 27

Urban Planning — Cities of the Future 28

Appendices 29

Bibliography 37

Introduction

The Instructional Resource Guide for Environmental Design consists of instructional units with suggested resources and appropriate activities for each grade level or course from Grade 6 to 12. See the current *Program of Studies* for appropriate instructional objectives, Grades 6-12.

It is recommended that environmental design concepts be introduced in conjunction with other concepts pertaining to science, social studies, principles of design, and various art processes. In addition to the special activities suggested, environmental themes may be encouraged during drawing, painting, printmaking, sculpture, photography, filmmaking, and creative craft lessons.

Acknowledgments

The staff acknowledges the direction provided by the use of environmental education publications from the American Institute of Architects; the advice and information obtained from the Cellar and Attic Studio of Washington, D.C.; and the resources made available by the National Trust for Historic Preservation. There is a continuing need for teachers to keep informed regarding developments related to the concepts stated in this guide and a need for them to explore alternate methods for classroom presentations. By using these concepts and working with teachers of science and social studies, it will be possible for teachers of art to be effective in establishing an environmental context for education.

The original draft of the MCPS instructional guide to the teaching of Environmental Design was prepared by art teachers John Andrus, Geraldine Hunter, and Faye Turner. Planning, coordination, and revision was done by Emil Hrebenach, Coordinator of Secondary Art.

Overview

The need for an instructional guide with resource listings for use in the study of environmental design is consistent with the growing awareness of and concern for our environment. Knowing that no species of living thing can be replaced once it has become extinct and that polluted air can endanger our survival, we need to express deep concern and determination to conserve the natural environment. A closer look at the environment, however, reveals that our social and economic systems are also changing and, to some extent, eroding. Technologial and economic systems affect the way people live; and the conditions under which people live and work often affect the way people behave. The thesis that we shape our buildings and they, in turn, shape us, can easily be extended to include any space we design regardless of whether it is a room, a park, or a city. The extent to which these designs are successful depends upon the designer's ability to integrate social, technological, and aesthetic factors in the design solution.

Given this assumption, an environmental context for education can be justified for several subject areas, particularly art, social studies, and science; and there is a need for environmental units of instruction in the art program, particularly in general art and commercial art courses. Included in this guide, then, are suggestions for methods for correlating instruction with other subject areas without imposing instructional objectives upon these areas. It is intended that in planning environmental design units, art teachers will consult teachers of other subjects in order to develop truly integrated programs. The goals of this program are to help students develop an awareness of our designed environment, recognize opportunities for influencing our environment, and acquire an understanding of the environmental design process.

More specifically, the purpose of incorporating environmental design units in the art program at every level is to help students:

- discover that human needs are met by a variety of environments and institutions
- conceptualize that quality of life is shaped by the interactions of human institutions with the environment
- relate the utilization of resources to environmental quality and, in turn, to quality of life
- begin to formulate criteria for rational use of the environment on the basis of desired quality of life
- feel able to participate with others in clarifying an environmental problem
- determine the extent of one's dependence on the design and marketing professions
- begin to develop empathy with people of other cultures in evaluating the effects of society upon them
- understand technology as the use of human knowledge, skills, and tools in interactions with the environment
- begin to evaluate new technologies on the basis of human priorities and a sound environment
- classify a variety of perceptions of the human role according to their impact upon the environment
- clarify and evaluate one's own view of the human role in terms of its impact upon the environment

Awareness

Increasing student awareness of the designed environment is one of the primary goals supported throughout this guide. Each unit of instruction will provide added insights into the condition of our environment and the degrees to which it meets the ideal. In addition, at the beginning of each unit of study, there is a section entitled Preliminary Exercises listing a variety of activities designed to increase student awareness. Teachers may assign, or students may select, one or more of these exercises which seem appropriate to a given unit. Numerous other exercises are described in Wilson's *Built Environment: A Teacher Introduction to Environmental Education* as well as in other books listed in the bibliography.

Environmental learning need not be restricted to special areas set aside for that purpose. The neighborhood environment between the home and the school offers a wealth of learning experiences for students. When used as a starting point for environmental awareness, the neighborhood — whether urban, suburban, or rural — provides a basis for comparison with other environments.

A walk through the school neighborhood need not be a difficult experience for the teacher nor an unproductive one for students. However, it is necessary to structure such a field trip with pre-site, on-site, and post-site activities. The class is prepared first for the activity by a discussion of the theme or purpose of the trip followed by formulating plans by which those purposes will be met.

A check list, survey sheet, or list of questions should be prepared in advance of the lesson. Students will need sketch pads or notebooks. The class should be made aware of the code of conduct that applies during the trip and be informed of the type of project that will follow.

Since these are exploratory and data gathering trips, students may work independently or in small groups. A richer experience will result if students investigate stated concerns which relate to the social, scientific, historic, or mathematical areas of the curriculum as well. The follow-up activity in the classroom should be directly related to the information or to the materials gathered, and it should utilize a variety of resources provided by the school.

The Design Process

Design is a goal-directed, problem-solving activity that utilizes collected data; sense of aesthetics; develops a knowledge of production systems or processes; and demands evaluation of proposed solutions. The design procedure generally adheres to three major phases which can be identified as analysis, synthesis, and evaluation. *Analysis* consists of identifying constraints and goals and collecting and summarizing necessary data. The *synthesis* or idea stage relies upon collected data, recollection of past experiences, use of existing concepts, and possible development of new concepts. During this stage, a number of possible solutions are suggested for further analysis and comparison. The *evaluation* of a design determines, within given constraints, the degree to which a goal has been reached. Field testing or trial implementation of a design is generally conducted as part of an evaluation. The results of these activities may suggest further modification of a design or indicate the need for a new approach.

An instructional program dealing with the environment is most effectively presented through individual and group activities. These may relate to one or more of three categories: (1) observation and communication, or learning from one's own environment by mapping, photographing, interviewing, sketching, and making lists; (2) theoretical problem-solving; and (3) real world problem-solving. Activities in these general categories can occur sequentially, irregularly, or in any other way that works. However, observation and communication activities should be conducted at every level to reinforce and expand student perceptions. A variety of exercises and projects designed to heighten student awareness of the environment should be developed to meet the needs and interests of each class. A list of suggested activities is included in this guide.

Tim Jeffs, MCPS Visual Art Center

Environmental Awareness Exercises and Projects

A heightened awareness is prerequisite to understanding an environmental design that is responsive to the needs of people and nature. The following exercises and projects are suggested as ways to promote student awareness and to encourage creative design solutions to environmental problems.

Lists and Surveys

- Select a simple object such as a baseball bat or a frisbee and list as many uses for it as you can, related or not to its normal use.
- Look at a television commercial without having the volume on the TV. Make notes on the kinds of sounds you think would best fit various segments with the actual sounds. Try to watch and listen to the commercial another time, comparing your list of sounds.
- Make a list of all the people employed in your school and identify them by their responsibilities.
- With a special purpose in mind, take an imaginary trip to the library, the cafeteria, or to a shop/home arts class. Make a list of the things you would do to accomplish the purpose of your trip. Try to arrange your list of actions in their logical order. (See Appendix B.)
- Make an inventory of the different types of buildings or houses in your community. Various groupings may be used, such as type of construction, style, color; or those having a garage, patio, or carport. Count and average the number of cars per house. Note the number of boats and trailers. Observe how many houses have fences, walls, hedges, and garden sheds. Design a chart that would show this information at a glance.
- Survey the houses in your community for architectural elements and details. (See Appendix E for a sample chart of architectural elements and details.) Add other details, and use the code numbers in your survey sheet.
- Conduct a market survey to determine the most desirable characteristics for the product or service you are designing. Develop a survey form (or make copies of the sample in Appendix F), and distribute copies to students during lunchtime. Summarize the returned questionnaires by using a similar form.
- Develop a matrix of objects having one or more common characteristics. Objects may be of the same color, size, or form; and they may be drawn in the matrix or simply written in notes. (See examples in Appendix A.)
- Use a group of architectural photos or allocate time during a field trip to identify examples of design principles which are evident in architecture. (Some principles are repetition, balance, harmony, emphasis, and unity.)
- Make a record of buildings which are being used today differently from their original purpose.
- Make a guidebook of your neighborhood, showing things of interest to young people, places of historical interest, and available means of transportation. (See Appendix C, "Elements of a Community.")

Charts

- Make an organization chart showing to whom each person in your school reports. The principal's name would be written in a box at the top of this chart. Every other name would be shown in a box which is below and connected to that of the person to whom the position is responsible.
- Develop a chart relating various objects to an average woman's or man's height, such as one-half, the same as, or twice as tall.
- Take a series of measurements of objects in the classroom or at home. Compare them with the average height of the students in the class.

Essays and Tapes

- Using a portable recorder, tape a variety of sounds that are common to a given location. See whether your classmates can identify the location represented in this sound collage. Try to name each sound as associated now and as to its probable source in the past or in the future.
- Invent a series of sounds and a name for their source. Make a tape recording and experiment with playback at various speeds.
- Write a simple explanation of the height of the classroom sink or file cabinet, using only word descriptions — no dimensions.
- Make a tape recording of sounds heard around the school — in the hall, the cafeteria, and the playground — and compare the general tone of each area.
- Write a poem about the sounds and odors of your house and street, the colors and textures of your house and street, or your feelings about your neighborhood.
- Write an essay about the way in which buildings and open spaces are changing in your neighborhood, the history of its people and buildings, or the positive and negative results of the building pattern.
- Make a slide show recording your street on different days or at different times of day.

- Make a tape recording of the sounds of your street at different times of day and at different locations.
- Make a photo essay of your neighborhood, showing children playing in different areas, people working in different areas, available means for people to travel, or various street and shop signs.
- Make a photo essay of opposites in your neighborhood:
  large and small spaces
  hard and soft things
  bright and dark places
  safe and dangerous places
  smooth and rough surfaces
- Create a musical composition expressing the sounds of your neighborhood, and record the composition on tape.
- Tape interviews with people who live and work in your neighborhood. Ask them to discuss the things they like or don't like about the area. Include friends, shopkeepers, police, etc.
- Tape an interview with one person in your neighborhood who has lived there many years.

Maps and Plans

- Draw a map expressing resident's description of your neighborhood.
- Develop a plan for a common activity such as shopping, bowling, or washing the car. List each different step or operation necessary to complete the task. (See Appendix B for an example.)
- Develop a motion plan or traffic pattern for a common activity such as going to lunch in the school cafeteria or spending an evening at home. Make a simple drawing of the spaces in which you will be moving. Number the different locations, in sequence, where you plan to stop. Draw a heavy line — dotted or colored — connecting these stops to show the pattern of your movement from place to place. Either label each stop or make a small sketch of the area beside each number.
- Develop a motion diagram for another person or for an animal that you have observed for a short time. You may show the movement pattern of a hand or a foot if the subject is standing in one location.
- Make a diagram of a football play or a dance, labeling each position and showing the path of movement. Use a different symbol for each performer's position.
- On a map of your community, plan the route for a parade. Include a staging area, a reviewing stand, and disbursement areas. Consider the need for comfort stations and emergency health and crowd control services.
- Draw a plan of the school and grounds showing where trash containers should be located and where flowers, shrubs, or display cases could be placed.
- Draw a plan of the school courtyard or other partially enclosed area; and show plantings, walks, fountains, and benches. Add features you would like to see.
- Obtain a street map of the area served by your school and draw it, enlarged, on the cafeteria wall or the hall wall. Label streets and public buildings or grounds.
- Make a map of a busy street showing places where different sounds and smells affect you.
- Make a map of your neighborhood showing your route to school, the places you go to buy things to eat, or the places where you meet your friends.
- Make a map of your neighborhood, showing different types of buildings, yards, and open spaces or trees.

Projects

- From newspapers and magazines, cut out three dozen examples of various styles of a single letter. On a sheet of paper, arrange half of them in an order ranging from simple to ornate. Arrange the other half in order from light or thin to dark or heavy.
- Paint a simple design using only black, white, and grays; or select a black/white design from a magazine. Translate this design into color, trying to match the values to those of the grays. This procedure may also be reversed.
- Using paper, cardboard, and foam plastic, construct a 3-D design and paint it white. Project various colored lights on this surface from different angles. Make slides or a film of the effects. Produce sounds or record music to accompany the film.
- Students take turns selecting an apple from a box containing six or more. Each student should use two terms to describe his/her selection without repeating terms used by others. Unique characteristics must be identified by each person. After returning all apples and rolling them around in the box, students should try to find the one originally selected. (Pieces of gravel, feathers, or other objects that are similar in size, color, and shape may be used.)
- Change the mood of the classroom by blocking out certain lights or by placing colored cellophane in front of lamps. (Keep cellophane a safe distance from heat.) Spotlights may be focused to produce large areas of color on walls or ceiling.
- Design a raceway for marbles using found materials like paper tubes and utilizing the force of gravity. The problem is to transfer an object from one location to another in the most efficient way.

- Make a drawing of details of a building you like on your street or in your neighborhood, a place where you and your friends meet, or a view from the front of a house or building if you could remove the front wall.
- Make a collage or mural of scenes, buildings, and objects in your neighborhood.
- Make a model of your neighborhood, showing your street, your playground, and your school.
- Compare and contrast two or more of the following types of business centers:

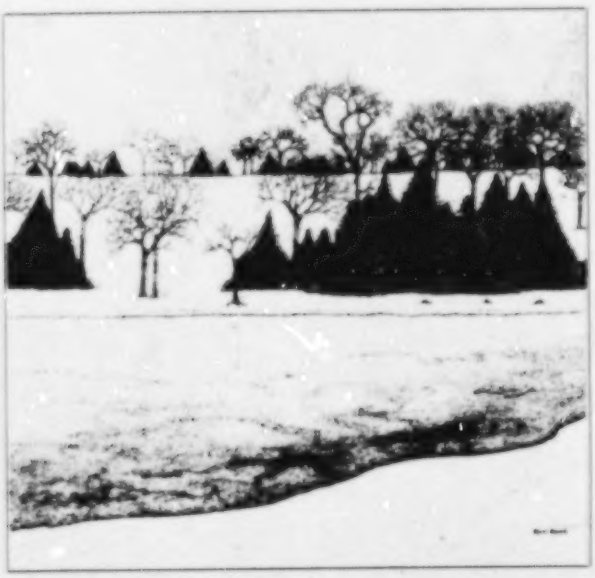
Eastern bazaar	machines, and trucks)
marketplace (farm market)	shopping center
	village square
medieval street	shopping mall
main street with side streets	drive-in
	shops and services
street vendors (stands, carts, vending	shopping arcades
	neighborhood store

- Make a study of one or more of the following by making sketches, drawings, maps, photographs, or word descriptions.

street lamp designs	parade floats
roadside signs	World's Fair pavilions
fences	zoos
parades	hamster cages
churches	birdhouses
schools	doghouses
monuments	skateboard centers
traffic signs	riding clubs
fire hydrants	recreation centers
vehicles	bicycle racks
pedestrians	flower boxes
animal shelters	aquariums

- The following environmental design projects are described in the Art Concepts and Activities Bank section on Design. They may be selected by students as optional or additional activities during appropriate units of study.

D-6 Design a door.
D-7 Redesign a road pattern that will eliminate a bottleneck or traffic snarl.
D-13 Design a new floor plan for your home.
D-14 Redesign a community environment.
D-17 Design and construct a model of a room you have dreamed of, using a variety of materials.
D-19 Design a new floor plan for your home.
D-20 Construct a space frame (a bridge) based on the triangle, which will span two feet and hold up ten pounds.
D-21 Draw a map of a familiar area.
D-23 Study and measure the rooms in your house and draw a floor plan showing relationships.
D-26 Construct an atypical set for a play.
D-27 Redesign a crowded downtown area where urban congestion is evident.
D-28 Construct an effective wall divider for classroom space.



Barbara Zoanelli, MCPS Visual Art Center

Illustrative Units

The following instructional units are included in this guide for the grade levels and courses indicated:

Grade 6
- Environmental Awareness
- Recreational Environment — Playgrounds

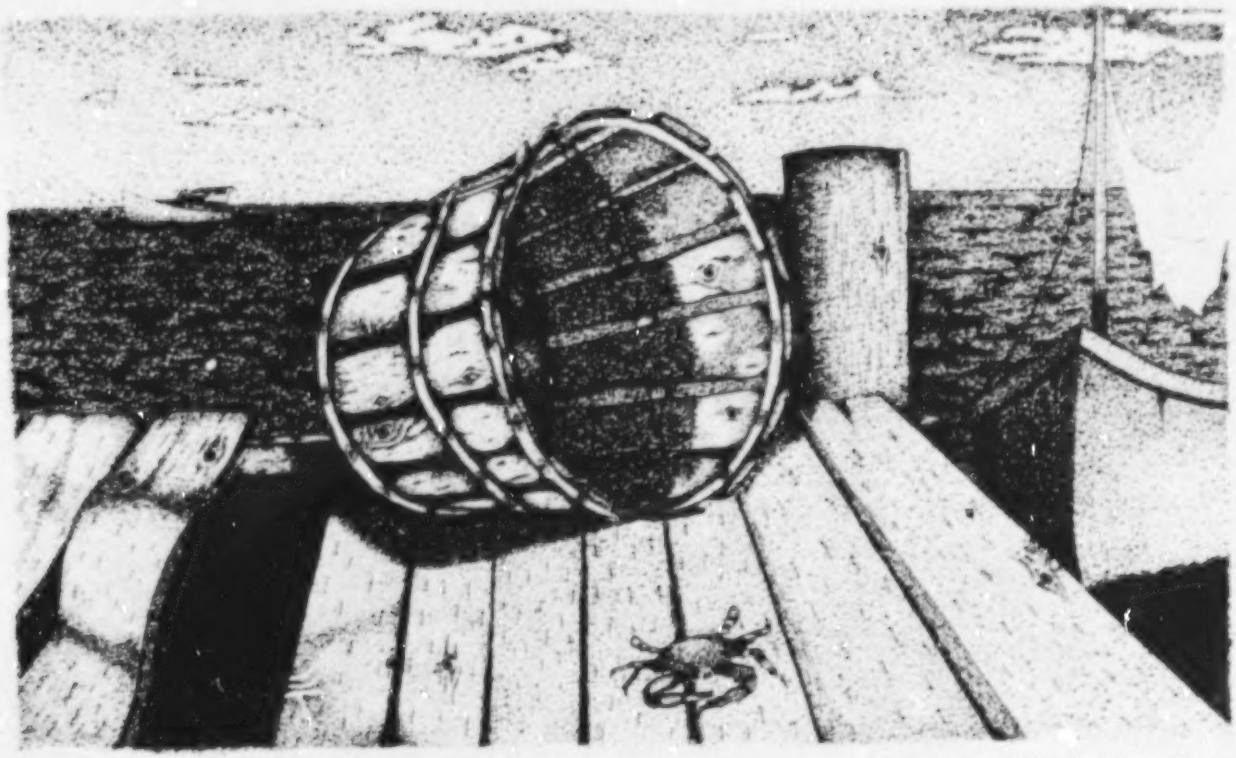
Grade 7
- Recreational Environments — Amusement Parks
- Architecture — Single Space Shelter
- Community Environment — Graphics

Grade 8
- Community Environment — Social Needs
- Community Environment — Street Furniture
- Recreational Environments — Gardens

Fundamentals of Art
- Architecture and Natural Forms
- Recreational Environments — Recreation Parks
- Historical Environments — Public Monuments
- Historical Environments — Architectural Preservation

Commercial Art I
- Architecture — Residential
- Architecture — Modular Design
- Architecture and Climate

Commercial Art II
- Interior and Industrial Design
- Urban Planning
- Urban Planning — Cities of the Future



James Bruno, MCPS Visual Art Center

GRADE SIX Environmental Awareness

Recreational Environments — Playground

All the Arts are brothers; each is a light to the others.
— Voltaire, philosopher, 1762

Environmental Awareness

Instructional Objective: *The student should be able to demonstrate a greater awareness of various components of the environment.*

Performance Objective: Identify significant landmarks en route to school, and develop a map of that route.

Suggestions for Instruction

How people find their way to a destination is a fascinating process we hardly ever think about. Relate this story to the class:

Years ago, an American anthropologist went to the northern reaches of Alaska to study firsthand the culture of an Eskimo tribe. One day, he went on a hunting trip with a party of Eskimo men. They travelled for several hours in heavy snow in the dark of morning. Finally, after crossing miles of ice fields and it had become light, they came upon a herd of caribou and spent more hours trapping, killing, and loading the animals on dog sleds. After completing this work, the few hours of sunlight had already passed and darkness was increasing rapidly. The anthropologist was panic-stricken. How would they ever find their way back to the village? There were no roads, no signs, no landmarks, no compasses — just the great frozen expanse and the falling snow. But that was enough for the Eskimos, who were able to read the direction they must travel by the wind — its directions and odor — and by the angle of the snowfall. After years of experience, they were able to see what someone of another culture could not — they could read the snowfall! Needless to say, the anthropologist returned safely to camp with the Eskimo hunters.

Suppose an Eskimo anthropologist came to your town and walked with you to school one morning. Certainly he would be confused, probably overwhelmed, by the number and kinds of signs and symbols you encounter. He would want to know *why* you walked where you did; *how* the drivers know when and where to go; *when* you decide to turn a corner; *how* you knew you were "half way" there; and *how* you knew where to enter the school. If he walked with you, he might try to map his way. How would you map the trip so the Eskimo could walk from your house to the school without you as a guide? What kinds of information would you be certain to include? What cues would you tell him to look for?

Assessment Measure

Students exchange maps of their routes to school. On a master map of the school area, prepared by the teacher, each student points to the location of the house of a friend. Pin-flags with student names may be used.

Resources

MCPS Environmental Education Series — Activities for Map and Compass Study (4-6)

Tim Jeffs, MCPS Visual Art Center

This is the city, and I am one of the citizens.
Whatever interests the rest interests me.
— Walt Whitman, poet, 1855

Recreational Environments — Playgrounds

Instructional Objective: *The student should be able to discuss the recreational needs of people and describe the design of a recreational environment.*

Performance Objective: Identify the functions of a playground and relate them to environmental and design concerns.

Suggestions for Instruction

Discuss the need for playgrounds, the groups who use them, and the activities conducted there. Consider design in terms of safety, economy, and conservation of the existing environment. Relate the design to the range of heights for the children using the playground. Display photographs of professionally designed playground equipment and give examples of equipment that may be constructed from a variety of materials. Discuss the need to conserve and recycle materials to save energy and resources. Integrate this topic with science and social studies. Refer to specific pieces of equipment which may be seen at a local playground and identify construction materials which may be used in assembling this equipment, such as storm sewer pipe, step ladders, automobile tires, barrels, and rope. Check with a lumber or building supply dealer — and with the junkyard to find other possible materials for playground use. Compare Woodside Park on Georgia Avenue in Silver Spring with the play area in Cabin John Park or Wheaton Regional Park. Display a map showing a plot of land located in the neighborhood. The map should show contour lines with elevations and the location of trees, hills, large boulders, streams, etc. (See Appendix H.) Review map reading skills and interpret the contour line. Lines close together indicate much slope to the land. Students should design the playground equipment and plan its placement, using the existing environment to advantage. The materials available for the design of the equipment may be logs, lumber, cable spools, rope, concrete pipe, and auto tires. Include areas of proper dimension within the playground for games like basketball, tennis, hopscotch, shuffleboard, and tetherball. Specify fencing and walkways where needed. When the designs are complete, the student will prepare a drawing or model of a completed playground.

Assessment Measures

The following criteria are suggested for the assessment of student designs. To what extent:

- does the design of the equipment appear to be safe and economical?
- has the student utilized the existing environment in his/her design?
- does the design demonstrate a concern for conservation of the environment?

References

Athletic Field and Court Diagrams. Wilson Sporting Goods Co.
McHarg, Ian L. *Design with Nature.*
Planning Facilities for Athletics, Physical Education and Recreation. The Athletic Institute.

Other Resources

Pamphlets from the Maryland National Capital Park and Planning Commission

GRADE SEVEN

Recreational Environments — Amusement Parks

Architecture — Single Space Shelter

Community Environment — Graphics

We have only two choices at this point — we can actively plan our urban environment, or we can just let it happen.
— Paolo Soleri, architect, 1970

Recreational Environments — Amusement Parks

Instructional Objective: *The student should be able to discuss the recreational needs of people and describe the design of a recreational environment.*

Performance Objective: Identify and describe the relationships between various components of an amusement park.

Suggestions for Instruction

Carnivals, fairs, and amusement parks are special environments that are planned for entertainment and relaxation. The activities provided are often informative as well as entertaining, especially at trade fairs and world fairs. Amusement parks are becoming more informative as they are designed around a central theme. Parks like Busch Gardens and Disneyworld emphasize one or more themes related to various world cultures, the past, or the future. The theme park is an excellent site for studying a variety of built environments.

Consider amusement parks to be balanced arrangements of environments for movement and rest, comfort and excitement, eating and conversation. Relate these elements to the various types of structures and spaces generally provided in an amusement park.

Refer to David Christopher's article "Travel Guide to Theme Parks"; and collect descriptive literature on amusement parks like Disneyland, Sea World, and Hershey Park. With the class, develop a chart that shows various kinds of amusement park structures, facilities, and spaces. Include the rides, food concessions, games, comfort stations, transportation facilities, gardens, and picnic areas.

Develop a set of graphic symbols to be used by all students in planning their designs. Identify and display the markings used by architects and landscape designers to show trees, shrubs, walks, and streams. Review the concept of working to scale.

Provide a map of a large irregular tract of land indicating the location of forested areas, streams, hills, and roads. Using this site, students should design a layout of an amusement park with graphic symbols identifying the various structures. Students may, instead, build a topological model and locate clay or cardboard structures according to a plan. (Refer to *Anatomy of a Park* by Rutledge for sample park plans and symbols.)

Assessment Measures

Students will assess their own designs using the following criteria:

- Natural elements are a part of the plan.
- Parking areas, walks, and food and rest facilities are included.
- Structures are grouped or scattered according to their function and need.
- All elements are shown to scale.

References

Christopher, David. "Travel Guide to Theme Parks," *Instructor*
McHarg, Jan L. *Design with Nature*
Rutledge, Albert. *Anatomy of a Park*

Other Resources

Free Booklets:

Rembold, Charles C. *Guidelines for Campground Development.*
———. *Signs and Symbols for Park and Recreation Use.*

A good place to live in must have identity, a sense of place.
— Wolf von Eckart, architectural critic, 1967

Architecture — Single Space Shelter

Instructional Objective: *The student should be able to conceptualize the design of a structure or form.*

Performance Objectives:

- Analyze the basic functions of a one-room vacation shelter.
- Identify the standard forms of common single-unit structures and investigate new forms.
- Indicate a preference for a particular architectural form and adapt it to personal interests and needs.

Suggestions for Instruction

A one-room vacation shelter is a very personal space. Unlike other houses, a single-unit shelter must be perceived as a trailer or space capsule in terms of the activities and functions performed in it. Spaces must be allocated to various functions with compactness and efficient use as primary criteria for design. Moreover, this compact living unit must provide privacy as well as easy access to surroundings. Since it is generally located in very natural surroundings, the configuration of a unit should harmonize with adjacent natural elements.

Display and discuss a variety of examples of small beach and mountain vacation shelters printed in home planning magazines. Obtain literature on trailers and mobile homes also. Students are encouraged to describe other shelter designs they have seen and volunteer to develop original designs for later planning. Students must select a design for their own study.

Students then list the activities they would conduct in a vacation home and itemize the furnishings needed. They draw a plan view of each piece to scale (1/2" = 1') on cardboard label, and cut them out. Using graph paper, students will lay out the pieces representing furniture, and arrive at an optimum floor space that fits the house selected. Locations of windows, doors, chimneys, and steps must be indicated in the structure selected.

Students transfer their completed layout to drawing paper, label all furnishings, and give overall dimensions of the space.

Assessment Measure

Compare the floor plan with a photograph of the structure, and determine the extent to which the plan would fit the exterior.

Provisions for Individual Differences:

- Students may construct a cardboard model of their structure.
- They might instead develop a specification chart showing their selection of interior and exterior paints, floor and wall coverings, and accent colors of furniture.
- An efficiency apartment or a van may also be offered as structures for planning.
- Some students may prefer to plan and design a chicken house, a rabbit shed, or a stable.

References

Dalzell, W. R. *Architecture.*
Hohauser, Sanford. *Architectural and Interior Models.*
Papanek, Victor, and Hennessey, James. *Nomadic Furniture One.*
Walker, Lester, and Milstein, Jeffrey. *Designing Houses: An Illustrated Guide.*

MCPS Film:

F-4273 *Let's Build a Home.*

Many components of a city are desirable, but only two are absolutely essential. One is people and the other is transportation. Transportation makes cities possible.
— Roger Starr, city planner, 1966

Community Environment — Graphics

Instructional Objective: *The student will be able to identify communication elements or processes in the urban environment.*

Performance Objectives:

- Develop and design a system of graphics which would aid students and visitors in locating a specific area in a school.
- Design graphic symbols that are aesthetically pleasing and functional, representing a specific subject.

Suggestions for Instruction

The city is full of communication devices that control the movement of pedestrian and automobile traffic. Street signs, stop lights, sirens, barriers, horns, and railroad crossing gates are a few. Display and discuss photographs or examples of commercially produced graphics in use today that incorporate symbols to communicate a message. Refer to the symbols commonly used to designate traffic lights, gasoline stations, restaurants, restrooms, telephones, etc. Do the symbols clearly represent the subject? Discuss the need in the school for graphic designs to help direct students and visitors to various locations. For example: Plan and mark the easiest and quickest route from the main entrance to the art exhibit in the art rooms — or the music festival in the auditorium. This lesson may be planned as a group activity.

To learn the location of subject areas and other facilities, students walk through the school or study a floor plan. From a given location, each student will design directional graphics using symbols that will aid others in finding different parts of the building. Design symbols that will identify the science department, the art department, the music department, the cafeteria, and others. Design directional arrows to accompany these symbols. In a practicum, the graphic designs may be posted in appropriate areas, and hall showcases should contain displays related to the occasion.

Assessment Measures

The following assessment criteria may be applied to student work. To what extent:

- are the graphic designs well proportioned and appropriately colored?
- do the symbols clearly represent the subject specified?
- do the graphic designs function effectively?

Survey visitors to the school on back-to-school night or a similar occasion to determine how effective the directional signs were.

References

Helfman, Elizabeth S. *Signs and Symbols from Around the World.*
Kepes, Gyorgy. *Sign, Image, and Symbol.*
Wurman, Richard Saul, and Killinger, Scott. "Visual Information Systems," *Architecture Canada*, March 1967.

Free Films:

Design for People
Street Graphics

MCPS Film:

F-7712 *The Noisy Landscape*

GRADE EIGHT

Community Environment — Social Needs

Community Environment — Street Furniture

Recreational Environment — Gardens

Considering that it's our life, our city, and our money, why should we not participate in . . . creating our own beautiful cities?
— Nathaniel Alexander Owings, architect, 1969

Community Environment: Social Needs

Instructional Objective: *The student should be able to collect and analyze data for the interpretation of an environment.*

Performance Objectives

- Identify and survey informal meeting places in the local environment.
- Examine the requirements for improving an informal meeting place.
- Consider environmental and social factors in designing improvements for an informal meeting place.

Suggestions for Instruction

People need places to meet both formally and informally. Churches, schools, and theatres are designed for each specific group to meet for a special purpose. The places where people meet informally are not so well defined, but they may be identified everywhere. Squares, commons, plazas, town centers, shopping malls, depots, and airports are all examples of places that offer space for informal meetings. In recent years pocket parks and shopping centers have been designed to provide places for people to rest and congregate.

Some meeting places are famous. The Biltmore Hotel in New York advertises that three generations of people have met under the clock in the lobby. Students may have met friends by the pendulum in the Technology Building at the Smithsonian Institution or at the carousel on the mall in the summer.

Students should discuss and list the places at which informal meetings occur in or around the school and/or community. Frequently, a landmark or architectural detail is part of the meeting place. "Under the arch," "beside the statue," or "on the steps" are phrases that identify many meeting places.

Groups of students are assigned to survey each of the locations listed. Every day for a week, students will visit the locations at different times of day and record the number of people present and the kinds of activity conducted.

The data from these observations should be compiled and an analysis chart developed.

Additional investigation should be conducted by students. They may ask the principal or a county official such questions as:

Would the areas under study create a safety or fire hazard if they were more extensively developed?

Would traffic patterns change and congestion result?

Can the area be developed without producing these and other problems?

After a site has been determined to be socially and culturally desirable and all restrictions on the use of the site have been determined, students may develop designs for its improvement. Furniture, plants, art work, and ground floor or wall treatment using super-graphics may be specified and shown in the renderings or models produced.

Designs that are approved for implementation may become a cooperative venture in which home arts, industrial education, agriculture, or biology classes contribute by making furniture, benches, and trash containers, or by laying pavements and planting shrubbery. The maintenance of this student-designed meeting place should also be planned. This could be undertaken by a social or environmental club with support from the departments that were responsible for the site development.

Assessment Measures

Designs should be displayed where the student body can vote for the site improvement most needed and for the best design solution for each. The decision to implement any site improvement will be determined by the staff and administration.

References

Free Film: *An Environment for People*

Sites to study:

Courtyards — Walt Whitman High School; Sligo Junior High School

Front grounds — Walter Johnson High School; Paint Branch High School

All cities are mad, but the madness is gallant. All cities are beautiful, but the beauty is grim.
— Christopher Morley, novelist, 1922

Community Environment — Street Furniture

Instructional Objective: *The student should be able to correlate transportation and communication elements or processes in the environment with community needs.*

Performance Objectives:

- Identify factors that influence the design of street furniture and shelters.
- Correlate architectural styles with other street structures.

Suggestion for Instruction

Street furniture is commonly accepted as a necessary element in the functioning of a community. Street lights, traffic signals, fireplugs, alarms, mail boxes, trash containers, and benches are essential to the efficient and convenient operation of daily street activity. The sensitive correlation of the design of these fixtures not only improves appearances but can result in more effective and economical installations. Bus stop shelters and kiosks for pedestrian comfort and information are usually the last items provided.

Discuss message centers used by the public such as bulletin boards, billboards, and bus interiors. List the major factors that should be considered in the design of a kiosk. Discuss design in terms of maintenance, durability, possible vandalism, safety for users, and size. Display and discuss a variety of construction materials appropriate to each structure.

Display and discuss examples of different styles of current architecture which may be reflected in a kiosk design. A functional kiosk would be lighted at night and would protect posted materials from the weather. These criteria will be applied to the evaluation of design by students.

Assessment Measure

Students design a kiosk which fits their selected location.

Provision for Individual Differences:

- Design a route map for the kiosk.
- Design a poster or announcement for the kiosk.
- Make a rendering showing the structure in its setting.
- Work with the industrial arts department and build a kiosk for the school.

References

Free Films:

An Environment for People
Street Graphics
What Do You Mean by Design?

MCPS Film:

F-7712 *The Noisy Landscape*

Tim Jeffs, MCPS Visual Art Center

The city has always been shaped by cultural and personal values.
— Moshe Safdie, architect of Habitat, 1970

Recreational Environments -- Gardens

Instructional Objective: *The student should be able to recognize relationships between natural and human-made environments.*

Performance Objectives:

- Conceptualize the garden as a recreational environment that is both natural and human-made.
- Develop garden design using collected information about plantings and a knowledge of garden styles.

Suggestions for Instruction

The hanging gardens of Babylon are among the oldest known gardens designed for recreational purposes. Through history, people have demonstrated their need for an outdoor retreat by developing public and private gardens. Ancient and medieval gardens centered around homes and monasteries, as did gardens of the Middle East. The Renaissance brought a rebirth of botanic gardens and park gardens in the Netherlands, France, and England.

Majestic and formal French gardens like Versailles led to more gentle, parklike landscape gardens in England and Russia. These included lakes, trees, and architectural elements and influenced the design of three gardens near Charleston, South Carolina — Middleton Place, Magnolia Gardens, and Cypress Gardens. Other types of gardens are botanical, park, flower, cactus, woodland, topiary, rock, water, lawn, roof, greenhouse, scented, herb, vegetable, window box, and Bonsai.

Discuss the variety of gardens which may be designed by students. Display photos and list examples with which students may be familiar. Discuss the characteristics of such contrasting gardens as Cypress Gardens in South Carolina and Florida; Ladew Topiary Gardens in Monkton, Maryland; the cactus garden at the New York Botanical Garden Conservatory; the water lily garden at the Washington Botanical Gardens; and the herb garden at the Washington Cathedral.

Some characteristics which may be discussed and illustrated are (1) the simple, asymmetric, contemplative Japanese level ground garden; (2) the formal pattern of walks, hedges, and sculptures at the Governor's house in Williamsburg; and (3) the combined formal and informal landscape gardens of Dumbarton Oaks.

If possible, visit the Brookside Nature Center at Wheaton Regional Park, the National Arboretum, or Dumbarton Oaks in Georgetown.

Collect a variety of seed catalogs and gardening books for student reference and study. With the class, develop a matrix which groups trees, shrubs, and flowers according to height and sun requirements. (See Sample Matrices, in Appendix A.) From this matrix, students will be able to select appropriate plantings to fit their designs.

Assessment Measure

Students select a garden style they wish to develop; study the catalogs and pictures of plants, shrubs, and trees; refer to the matrix to help with their selections; roughly designate areas for each different planting; refine the overall design into an informal or formal pattern; designate the placement of focal points such as benches, arbors, ponds, and sculptures. They should include walkways, rock formations, and location of the house.

The finished plan will show a symbolic pattern for different flowers and an architectual designation for trees and shrubs. Areas may be appropriately colored, and a reference chart may be developed with cutout or drawn pictures of the paintings, furniture, and sculpture.

References

Masson, Georgina. *Dumbarton Oaks: A Guide to the Gardens.*
Frohman, Louis, and Elliot, Jean. *A Pictorial Guide to American Gardens.*
Crockett, James. *Landscape Gardening.*
Guide to Public Gardens. Garden Club of America.
Fukuda, Kazuhiko. *Japanese Stone Gardens: How To Make and Enjoy Them.*

Filmstrip:

"A Renaissance Palace Garden: Villa d' Este."

Free Films:

The Gardens of San Simeon
The Japanese Garden
Gardens of Japan
Gardens of Britain

FUNDAMENTALS OF ART

Architecture and Natural Forms

Recreational Environments — Recreation Parks

Historical Environments — Public Monuments

Historical Environments — Architectural Preservation

When the citizen looks at plans for projects that people are to live in, he should consider whether he would like to live in them himself. One of these days he might.
— William H. Whyte, Jr., social critic, 1957

Architecture and Natural Forms

Instructional Objective: *The student should be able to identify visual and structural characteristics of natural and human-made forms as a source of design and infer relationships between form and function.*

Performance Objective: Compare and contrast human-made forms with forms occurring in nature. Create an architectural design based on forms found in nature.

Suggestions for Instruction

A number of architects and designers are known to rely on nature for inspiration in design, and no better source can be found. Frank Lloyd Wright is one of the more outstanding figures to have professed his dependence on nature. In his earlier beaux arts designs, Wright made extensive use of natural forms as motifs and decorations for his buildings. Reliefs of plant forms were carved into the stone or cast into the tiles that highlighted his exteriors, while stylized plant forms were integrated into his furnishings and interior decor. Furthermore, he viewed his architecture as organic to be compared to a tree. The nouveau designs of Louis Comfort Tiffany are also strong examples of designs based on natural forms.

Illustrate and discuss some basic design structures found in nature. Include patterns that are spiral, radial, parallel, axial, dendritic, and modular as well as those that occur in overall patterns such as grids, spots, and random patterns. Refer to *Patterns in Nature* by Peter Stevens, *Pattern and Shape* by Kurt Rowland, and Appendix G "Basic Structures."

Study photographs of plants and microscope slides of cells or transparent materials. Look at animal-built structures like bird nests, spider webs, beaver dams, termite and ant hills, wasp nests, bee hives, rabbit warrens, groundhog cities.

Identify the design structure of each. Refer to *Animal Architecture* by Karl von Frisch, *The Insects* by Peter Farb, and the *National Geographic* index.

Provide architectural examples of similar structures and ask students to make a drawing of each paired example. Comparisons may include the radial cross section of an orange with the Hirshhorn fountain; the spiral of a chambered nautilus with the cap of an Ionic column or with Wright's Guggenheim Museum. Eero Saarinen's Dulles Airport or the TWA terminal building at Kennedy Airport compares with the wings of a bird in flight. A suspension bridge suggests a spider web.

Assessment Measures

Students select a natural form and incorporate its basic structure in an architectural detail like a door frame or handle, a wall lamp or a window grille.

References

Stevens, Peter. *Patterns in Nature.*
von Frisch, Karl, and von Frisch, Otto. *Animal Architecture.*
Rowland, Kent. *Pattern and Shape.*
Guyler, Vivian. *Design in Nature.*

Filmstrip:

"Design Elements in Structural Form."

Tim Jeffs, MCPS Visual Art Center

Parks are the lungs of the city.
— William Pitt, politician, 1708-1778

Recreational Environments — Recreation Parks

Instructional Objective: *The student should be able to conceptualize relationships between natural and designed environments.*

Performance Objectives:

- Summarize the recreational, management, and service facilities appropriate for a given recreational park site.
- Specify the spaces required for each function in a recreational park facility.

Suggestions for Instruction

Discuss the human need for outdoor recreational activities. Frederick Law Olmstead was the first in this country to apply art to the improvement or embellishment of nature in a public park. He designed New York's Central Park and Washington's National Zoo. Since then, city, state, and federal governments have increased efforts to provide outdoor recreational facilities while preserving the balance of nature. This need increases with the growth of urban populations.

Take an inventory of Montgomery County to determine all the types of recreational opportunities available. Your inventory should not overlook:

Types of parks	Swimming pools
Types of playgrounds	Types of trails
Recreation centers	

Make a map showing the location of these facilities.

Design a survey sheet to determine the recreational desires of students in your school. Your survey might include the following questions:

- What do you like to do for recreation? (camping, hiking, swimming, boating, horseback riding, bicycle riding)
- Where do you go for recreation?
- What facilities do you use in the community?
- What other facilities do you wish were available in the community?

Take a survey in the community to determine the recreational facilities desired by:

young children	young adults
older elementary children	older adults
	senior citizens
teenagers	

Chart the information obtained from the inventory and survey in a manner that will help you gain a better understanding of your community's facilities, desires, and needs. Example:

Types of Facilities

	Available	Desired	Needed
Parks large parks, neighborhood, etc.			
Playgrounds tot-lots, neighborhood, etc.			
Recreation Centers			
Others			

Go to a local park to determine the recreational facilities and activities available there. Make a chart of your findings.

Compare the park designs of Wheaton Regional, Cabin John, Lake Needwood, and others in Montgomery County.

Make a map of a local park, showing:

parking facilities	access roads	campgrounds
service buildings	hiking trails	amphitheatre
comfort stations		

Seek professional assistance when designing your recreational site plan. Talk to a landscape architect or recreational planner.

Provisions for Individual Differences:

- Some students may prefer to study the preservation of animals in captivity by developing a design for a zoo, a circus, a bird cage, or a farm.
- After studying several small urban parks or shop parks, a student or small group may design one for a specific site.

Assessment Measures

Students evaluate their plans using the criteria below.

- Is the park entrance well located for easy highway entrance and accessibility to the various facilities?
- Is each facility or activity located in the most appropriate setting?

• Are facilities and activities provided for a variety of group interests?

• Are natural elements such as mountains, lakes, rock formation, animal refuges, trees, and shrubs considered in the placement of facilities or activities?

References

Halsted, Bryan (ed.). *Barns, Sheds, and Outbuildings.*

Hancocks, David. *Animals and Architecture, the Study of Buildings for Animals.*

McHarg, Ian L. *Design with Nature.*

Rutledge, Albert. *Anatomy of a Park.*

Free Film:

Heritage of Green.

Other Resources:

Defense Mapping Agency

Maryland National Capital Park and Planning Commission

Tim Jeffs, MCPS Visual Art Center

The great law of culture is: let each become all that he was created capable of being.
— Thomas Carlyle, philosopher, 1827

Historical Environments — Public Monuments

Instructional Objective: *The student should be able to demonstrate an awareness of historically-significant structures and to the character or personality of a community.*

Performance Objectives:

- Identify two general categories for monuments and give an example of each.
- Associate the characteristics of a visual form with a significant event or person.

Suggestions for Instruction

Historically, monuments and memorials have been constructed to commemorate a specific event or personage. Sculptural and architectural monuments are found in all countries around the world and refer to people and events of 3,000 years of history. Architectural monuments have taken the form of pyramids, obelisks, pagodas, columns, towers, arches, grottos, crypts, and mausoleums. Sculptural monuments may be a part of these structures. Since war is one of the most common events commemorated with monuments, warriors on pedestals can be found in most cities around the world. Guards carved in stone protected the tombs of ancient monarchs, while entire battle scenes are painted or carved on some monument walls. Some of the better-known monuments are the pyramids, the Taj Mahal, the Arc de Triomphe, and the Washington Monument. An unusual monument is the structure commemorating Pearl Harbor: it stands on a partially sunken battleship. A unique type of monument which symbolizes man's relationship with nature is the totem pole.

Monuments are a distinct part of our environment and, because they are placed in prominence, become landmarks or focal points of community activity. Often a park, a plaza, or a battlefield serves as the setting for a monument sculpture or structure. The plan for a Franklin D. Roosevelt monument combines all of these elements in a small park.

A national setting along the tidal basin in Washington will be redesigned to include a flower garden, walks, sculptures, and a small structure where visitors may see and hear a biographical program. The development of this type of monument requires the services of many professional and technical people to provide the environmental impact statement, the structures, landscaping, sculptures, and a media program.

Discuss the purpose and meaning of several selected monuments. Identify the event or personage commemorated, describing their characteristics, and comment on the impact each monument has had upon society. Describe the setting, the various directional approaches, and the relationship of the site to the community. Identify any symbolic forms used and discuss their meanings.

Teachers may assign the site and subject for a proposed monument, or students may select their own. After researching these two elements (the site selection and an appropriate name), students plan and design a monument sculpture, structure, or park.

Assessment Measure

Students produce a rendering or model of their designs and make a presentation to their class.

References

Free Films

The Statue of Liberty — Body of Iron, Soul of Fire
Monument to the Dream

The great buildings of our time are acts of faith, the Cathedrals of our time. As eloquently as any church or temple, they testify to man's potential greatness.
— Nathaniel Alexander Owings, architect, 1969

Historical Environments — Architectural Preservation

Instructional Objective: *The student should be able to conceptualize the built environment as being the result of a developmental process which reflects not only the history of those who built it but also the materials and technology used.*

Performance Objectives:

- Correlate several architectural styles with their periods in history.
- Distinguish between the construction materials or technology employed in a past and a present architectural style.

Suggestions for Instruction

Show slides/pictures of historical buildings similar to those in Montgomery County so that students may identify the characteristics of style that pertain to a given period. Students may collect pictures as examples of one functional feature from a variety of buildings (doorways, steps, roof lines); or they may concentrate on the many aspects of one significant building. They should be encouraged to sketch unique features of the historical building and to comment upon them in terms of (1) the function of the architectural detail, (2) the technology that probably led to the form, and (3) the probable socio-cultural significance of the building.

Some students may map a neighborhood in Rockville, Gaithersburg (to include Montgomery County Fairgrounds), Kensington, or Takoma Park, using the code from a chart that offers information concerning materials and technique. The development of the chart should be part of the project. Depending on the neighborhood studied, stylistic details such as "gingerbread" motifs in Victorian architecture, gothic gables, and classical capitals might be charted. (See Appendix E, "Architectural Elements and Details.")

Through close observation and analysis of a mapped area, by noting the number and kinds of materials and constructions, students can infer from the architectural details in a specific locale a trend of historical development.

A city or town environment lends itself better to this project because the strata of aesthetic development can be perceived. Renewal and restoration projects are obvious exceptions to the presumed pattern of urban decay. Awareness is strengthened by frequent sketching and analysis of architectural form. Some members of the class may concentrate on the often unnoticed "street furniture" — manhole covers, drains, lamp posts, refuse cans, and hitching posts.

An alternative to making a field trip to an old town would be to use an assortment of visuals. Obtain slides of historically significant buildings from the American Institute of Architects, the Montgomery County Historical Society, or the National Trust for Historic Preservation. Obtain a street map of any city and arbitrarily locate the oldest buildings in an early residential area. Spot others in a logical pattern, moving away from the oldest cluster. Label each location.

Assessment Measure

After studying each slide for style and various construction features, the class will assign a probable date and use a color code to record this on the map. When all sites have been dated and color coded, a pattern of development will emerge. This pattern will reveal that urban growth is directly related to periods of history.

References

Forman, H. Chandlee. *Maryland Architecture: A Short History from 1634 Through the Civil War.*

Jacobsen, Hugh. *A Guide to the Architecture of Washington, D.C.*

Kelly, J. Frederick. *Early Domestic Architecture of Connecticut.*

Whiffen, Marcus. *American Architecture since 1780: A Guide to Styles.*

Slides:

Architecture of the Federal Period and the 19th Century. Purdue University

Selected American Architecture: 1620-1900. National Trust for Historic Preservation

COMMERCIAL ART I

Architecture — Residential
Architecture — Modular Design
Architecture and Climate

If there is to be a city, there must be a sharing of the good life.
— 3rd century B.C., Aristotle, philosopher

Architecture — Residential

Instructional Objective: *The student should be able to demonstrate a knowledge of some of the social, technological, [ecological, and design] systems that affect the built environment.*

Performance Objective: The student should analyze his/her preferences in residential design and develop an interpretive model.

Suggestions for Instruction

Discuss the physical, social, and aesthetic needs of people. Develop a list of functions a house should serve. Discuss traffic patterns, storage, and utility needs. Consider the use of sunlight and shade to conserve energy for needed heating and cooling. Review standard methods for representing structural features with architects symbols. (Refer to *Architecture and Interior Environment* by Forrest Wilson. Obtain resource materials from the Industrial Arts and Home Economics Sections, Division of Career and Vocational Education, MCPS Department of Instructional Planning and Development.)

Students will prepare a list of the characteristics they would incorporate in a planned "dream house" and develop a bubble diagram showing various home functions and their relationships to each other, to the sun, and to the site.

A checklist should be developed by the class. It should include:

- general location and size of lot
- number of rooms and other spaces like garages
- types of materials preferred (outside and inside)
- landscaping
- style of architecture

Provisions for Individual Differences:

Some students may prefer to plan the interior of a mobile home, a van, or a trailer. Other students may plan the furnishing and layout of a single room, developing a color chart and supplying sample swatches of materials.

Assessment Measures

Using standard architectural markings, students should design and draw to scale the floor plan for a dream house.

The following criteria are suggested for assessment of student work. To what extent:

- Has the student reflected his stated needs and interests in the dream house design?
- Are the architectural markings used correctly?
- Are measurements scaled accurately?

References

Kicklighter, Clois. *Architecture: Residential Drawing and Design.*

Walker, Lester, and Milstein, Jeffery. *Designing Houses: An Illustrated Guide.*

Wilson, Forrest. *Architecture: A Book of Projects for Young Adults.*

———. *Architecture and Interior Environment.*

Periodical:

Art and Man, Vol. 7, No. 1. "The Master Builders."

The age of buildings is no index to the age of a community, which is formed by a continuity of people.
— Jane Jacobs, urban critic, 1961

Architecture — Modular Design

Instructional Objective: *The student should be able to demonstrate a knowledge of some of the social, technological, [ecological, and design] systems that affect the built environment.*

Performance Objectives:

- Recognize module-based components in architectural design.
- Design a multi-unit structure using module-based components.

Suggestions for Instruction

Bronowski in *Ascent of Man* states that the key to man's construction of complex architecture lay in his ability to combine building components, rather than relying on a single material in its natural state, such as a tree for a beam, or a single stone as a pillar.

Space inside ancient Greek temples was congested with columns which were needed to support the relatively short lengths of stone beams that could safely span them. The Romans increased the span between columns by using an arch to bridge their crowns. Gothic builders designed a higher and lighter space by using a pointed arch in combination with the flying buttress.

Contemporary structures provide a variety of spaces through the use of engineered beams or trusses and lightweight materials. Inflatable structures and geodesic domes provide even greater potential for enlarging spaces. Smaller room-size spaces are prefabricated in factories or on the ground and then placed into any desired arrangement. Habitat, assembled in this manner using cast concrete and fiberglass room modules, was designed by Moshe Saftie for the Montreal World's Fair. Paolo Soleri has started construction of another type of vertical city in Arizona's Canyon de Chelly. At this location, ancient tribes constructed module-type pueblos of adobe. Another type of design module, invented by Buckminster Fuller, allows the construction of huge domes that conceivably may someday cover a city. Scientists in Antarctica are working under a dome made of triangular module frames locked together.

Study a planned community like Reston in Virginia or Columbia and Montgomery Village in Maryland for examples of modular urban planning where several basic house forms are repeated.

Assessment Measures

Students should design a structure using components of two or more modules. Modules may be found objects such as containers, junk parts, or any form available in quantity. They produce a model for efficient, multi-unit housing in the future.

The models may be compared in terms of aesthetic value, structured feasibility, and social impact. The question of whether people can afford a detached single-unit dwelling on a lot should be considered as motivation for this type of housing.

As an optional project, students may plan an entire community using modular units and combinations of units to represent various structures. Discuss the social implications of multi-unit housing on a large scale.

References

Kepes, Gyorgy. *Module, Proportion, Symmetry, Rhythm.*

Newman, Oscar. *Defensible Space: Crime Prevention Through Urban Design.*

Wolk, D. *Visionary Cities: The Arcology of Paolo Soleri.*

Periodical:

Art and Man, Vol. 7, No. 1. "The Master Builders."

Filmstrip:

"Architectural Form: Origins and Use."

Free Film:

City Limits

Civilization is, before all, the will to live in common.
— Jose Ortega y Gasset, philosopher

Architecture and Climate

Instructional Objective: *The student should be able to recognize the importance of the environment as a factor in architectural design and the importance of architectural design as a factor in preserving the environment.*

Performance Objective: Identify several structural techniques which will accommodate excessive sun, wind, or rain.

Suggestions for Instruction

By trial and error throughout history, humans have designed and built structures from readily available materials, and these structures have withstood severe weather conditions.

Ingenuity at devising weatherproof structures from common materials has been one important key to human survival. Builders have always known that the durability of their structures was, in part, dependent on environment. We must understand and emphasize that the survival of our environment depends on whether buildings are designed to oppose nature or function as an extension of it. Today, primitive societies in the rain forest, as well as the condominium owners along the seashore, have learned to build on stilts or pilings in order to withstand the drenchings of rain and ocean waves. Noah's Ark is an old example of a structure designed to cooperate with nature. The ark survived its test by the elements, as have many fine structures. Among them was Tokyo's Imperial Hotel, designed by Frank Lloyd Wright, which survived an earthquake. Architects now design floating structures which are made to be cushioned from the shock of an earthquake.

The Eskimos built snow block igloos shaped to minimize the effects of arctic winds, and they built the tunnel entrances lower than the inside living areas to allow the cold air to drop below floor level.

The people of the desert in ancient times learned to cope with their environment; and in the Sahara today, houses may be buried under thirty inches of earth, using its insulating qualities for protection from severe heat of day and cold of night.

In America, New England farmhouses have additions that connect the house and barn so that animals can be tended by the farmer without the need to move banks of drifted snow. Old Southern homes have large porches and raised ground floors to take full advantage of cooling breezes in the warm, humid climate. The Indian tepee is ideally constructed of readily available animal hides and long poles. Ventilation is controlled by adjusting the flaps at the top and over the entrance.

In Normany, France, where winds are gusty and strong, many houses have rounded thatched roofs facing into the wind, while on the leeward side the roof opens into a conventional, peaked overhang. In Provence, the northern facades on many buildings have only one story and few windows as protection against the wind, while southern facades usually have two stories with shuttered windows and porches.

All buildings are solar collectors; architects and builders must learn to utilize better the oldest and often the most efficient collectors, windows and skylights. In the long run, there is little choice but to live with nature; with a growing shortage of fossil fuels, living spaces can no longer be designed to use only artificial means for heating and cooling.

Read the chapter "Climate-Control Earth Capsules" in *Architecture and Interior Environment* by Forrest Wilson. Discuss some of the ways builders have solved problems related to climate. Refer also to any book on solar heating. Discuss the need for awnings, vestibules, porches, etc. Obtain information from geography and science teachers about the climate and various countries and conditions believed to exist on planets. Review this information with students. Discuss winds, heat, radiation, etc. Discuss the possible environmental requirements of human beings living on another planet. Compare these with the environmental requirements of a pet hamster, a dog, or a horse.

Compare the plans of a house heated only by fireplaces with those of one using central forced air or one using electrical heat. How does each affect the design of a house? Show pictures and discuss Terraset, the underground solar-heated elementary school in Fairfax, Virginia. Discuss the ways by which technology has enabled us to build similar structures in very different climates through the use of air conditioning, heating systems, wall insulation, insulated glass windows, etc.

Use a series of pictures from *National Geographic Magazine* to show different houses and shelters from a variety of countries and historic periods. Ask the class to infer the kind of environment and climate each is in and state reasons for the inferences.

Assessment Measures

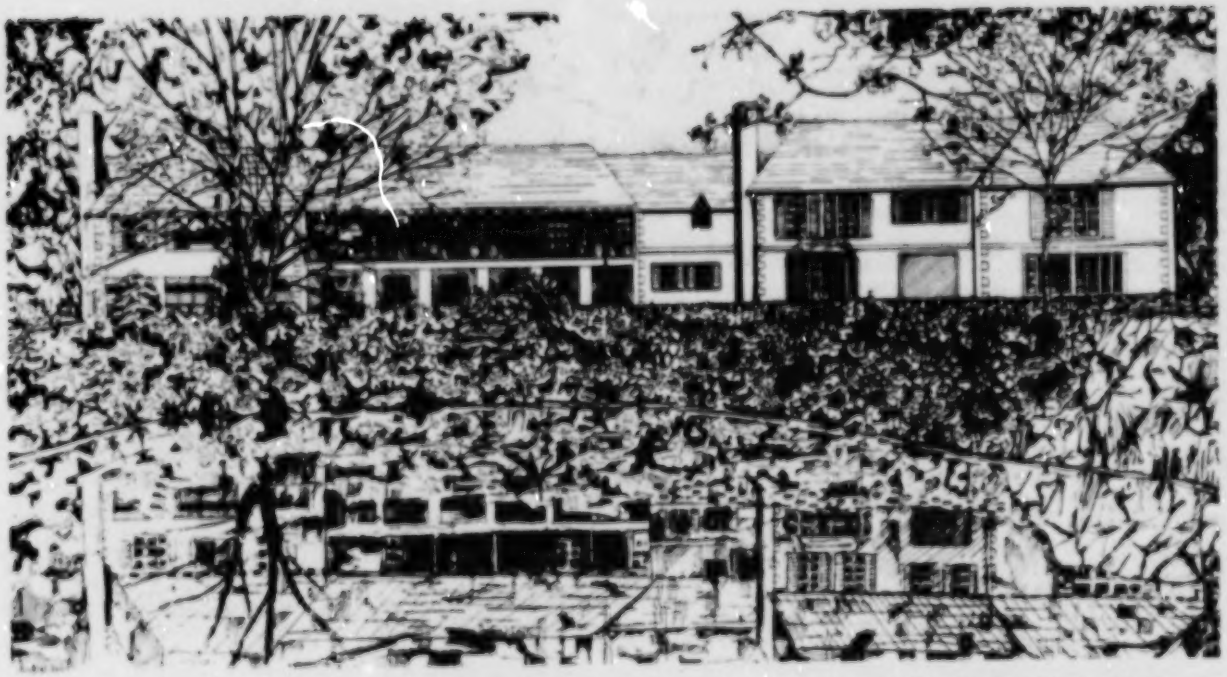
Students may choose a country or a planet for which to develop either a description, drawing, or model of a structure that would withstand the probable climate.

References

Halsted, Byron (ed.) *Barns, Sheds, and Outbuildings.*
Levy, Alan; Chapman, William; and Wurman, Richard. *Our Man-Made Environment,* Book Seven.

Filmstrip:

"Architectural Form: Origins and Use."



David Boskin, MCPS Visual Art Center

COMMERCIAL ART II

Interior and Industrial Design

Urban Planning

Urban Planning —
Cities of the Future

A man is uncivilized, barbarian, in the degree in which he does not take others into account.
— Jose Ortega y Gasset, philosopher

Interior and Industrial Design

Instructional Objective: *The student should be able to apply an understanding of the design process to an environmental or industrial design problem.*

Performance Objectives

- Identify the design characteristics of an interior or an industrial design product.
- Describe the steps necessary for developing a functional design.

Suggestions for Instruction

Prior to this century, architects designed their own interiors, and manufacturers relied on the decorating skills of various craftsmen. As investments in building and manufacturing increased, the need evolved for specialists to design interior spaces compatible with the architecture and for other specialists to integrate pleasing and functional forms with manufactured products. Sometimes the two specialties are combined and interior elements must be fabricated to specifications, as in airplane and store interiors. The industrial designer and the interior designer now make important contributions to the built environment.

Interior design has achieved recognition as a profession through the efforts of major architects Frank Lloyd Wright and Mies Van der Rohe, and through its emphasis at the Bauhaus School in Germany. The Bauhaus espoused the theory that architects, painters, and sculptors must recognize the composite character of a building. Usually, commerical interiors are designed by professionals while homeowners rely on their own preferences or take ideas from articles published on the subject.

The field of industrial design is more closely allied with the economics of manufacturing. Because large investments are made in manufacturing commercial products, business people rely on industrial designers to research, design, and package their goods. After a careful analysis of the consumer's preferences and needs and the manufacturer's engineering problems, designers attempt to develop economical, functional, and attractive designs that can be marketed widely or serve a special purpose.

Select for study a variety of common objects such as a kitchen utensil, a chair, a faucet, or desk lamp. A complete interior, like that of a boat or van, may be preferred for study by some students. (Refer to *Designing Today's Manufactured Products* by John Lindbeck.)

Students and teachers should collect a wide variety of photos depicting the chosen object or interior as it has appeared and as it is appearing at present in merchandise catalogs.

Studying all examples, have the class develop a list of characteristics which would describe the appearance, function, price range, maintenance features, etc., of each. Singly or in groups, students should design questionnaires to determine which variation of each characteristic of the chosen item a random group of consumers would prefer. (See Appendix F for a sample survey questionnaire.) Students must distribute survey forms among schoolmates, collect them, and summarize the responses. Since a schoolwide survey represents a restricted age group, decisions on product design will be biased.

Working with the survey responses, each student should interpret information and produce a new design. At this point, methods of manufacturing, packaging, and marketing should be considered. If a product contains mechanical parts, the designed form must accommodate all necessary elements like motors and switches. Students should research the materials and the manufacturing processes to be used. Ideas should first be developed in a series of thumbnail sketches and notes. Each sketch should be evaluated, using survey data, manufacturing limitations, and marketing requirements. After a class critique, the best idea should be developed into a rendering or prototype model. A surface finish, imitating the materials used, should be applied to the model of a product. Interior designs may also be presented in model form.

Assessment Measures

Compare survey data with the design solution, and list the steps that were followed in developing a design.

Display completed models and renderings in the library and take a popular vote on each group of solutions.

References

Lindbeck, John. *Designing Today's Manufactured Products.*

Papanek, Victor. *Design for the Real World.*

Periodical:

Art and Man, "The Shakers," Vol. 2, No. 5, February 1972.

Filmstrips:

"Industrial Design"
"Design for Use"

It is necessary to clarify to ourselves what we want of our cities, how we want to live in them, the kind of cities we aspire to build.
— Moshe Safdie, architect of Habitat, 1970

Urban Planning

Instructional Objective: *The student should be able to conceptualize some relationships between various components of a built environment.*

Performance Objective: Identify the major structural components of a community and incorporate them in a design for a city.

Suggestions for Instruction

The average citizen may not know that city planning is a much broader activity than simply arranging and regulating land uses. The city planner helps the community make decisions about its social and economic, as well as its physical, condition. City planners are concerned with the development of solutions to problems of living in changing urban communities. Their maps show master plans to develop and implement policies and programs intended to govern change, direction, and coherence of city growth. The following unit deals mainly with physical characteristics, but capable students should be encouraged to consider social and economic issues. (Discuss and correlate this unit with a social studies teacher.)

Study the plans described in *Making the City Observable* by Wurman, and the text *Babylon to Brasilia* by Hiller. Discuss the advantages of planned communities as contrasted with typical urban sprawl. Look at planned communities like Brasilia, Brazil; Greenbelt and Columbia, Maryland; or Reston, Virginia, and discuss the overall street patterns and locations of shopping centers and business services in relation to public buildings, parks, and recreational areas. Contrast and compare the agrarian planning ideas expressed in Frank Lloyd Wright's Broadacre City with Le Corbusier's plan for Chandigash, India, and Paolo Soleri's megacities, designed to provide compact urban living, at the same time preserving the countryside. Discuss open space as a community need. Discuss the location of apartments, multi-unit dwellings, and single-unit dwellings. Consider these questions:

- Is playground space adequately provided?
- Are hospitals, churches, and schools easily available to each neighborhood?
- How far do I drive to work or school?
- Can I ride my bike or walk to the store?
- Where can I play ball?

View and discuss the films *Why Man Creates* and *The City: Heaven and Hell.*

Use small blocks of materials to represent structures, and make preliminary models of a planned community showing residential and business areas. Differentiate between apartments and multi-unit and single-unit dwellings. Locate public buildings and recreation areas. Plan access routes for easy movement of traffic into and out of the community. Transfer this plan to a scaled drawing using a coding system to identify various components.

Assessment Measures

Compare student work against the following criteria. To what extent:

- Have the locations of public buildings been well chosen?
- Are there playground and recreational spaces?
- Are there enough major streets to handle through traffic?
- Are business and industrial buildings clustered near highways or railways?
- Are the types of housing and open spaces clearly differentiated on the map?

Conduct a survey, if feasible, using a form similar to that in Appendix D, "City/County Planning Survey."

References

Breckenfeld, Gurney. *Columbia and the New Cities.*
Hiller, Carl. *Babylon to Brasilia.*
Jones, Ron. *Your City Has Been Kidnapped.*
McQuade, Walter. *Cities Fit To Live In.*
Munzer, Martha E. *Planning Our Town.*
Schinneller, James A. *Art Search and Self-Discovery.*

MCPS Films:

F-4765 *Why Man Creates*
F-2839 The City: Heaven and Hell

Free Films:

The Best We Can Do
Design for a City
Designing the Urban Environment

Other Resources:

MCPS Environmental Education Series Activities for Studying Megalopolis

Men, not walls, make a city.
– Old Chinese proverb.

Urban Planning — Cities of the Future

Instructional Objective: *The student will be able to conceptualize some relationships between various components of an environment.*

Performance Objective: Formulate a solution to several community planning problems of the future based on a concensus of student opinions.

Suggestions for Instruction

The city is one solution to a number of problems that confront us today as they have in the past. Early cities evolved out of a need for protection from enemies, and originally took the form of fortresses. Walls and moats that were rebuilt in ever larger circles have been replaced in older cities like London by bands of parklike neighborhoods. Similar "green belts" are now a planned element in urban design and serve our need to have access to nature. In planning for future cities, consideration should be given to psychological needs as well as to the physiological and ecological. Today city planners seek solutions that are appropriate for human values, limited energy resources, and optimum use of the natural environment. Many views of the future see our being dominated by machines or colonizing outer space because of dwindling resources on earth. The "small-is-beautiful" movement would limit future development. One future model is described in the movie *Star Wars* which refers to an interplanetary society and an unknown energy source.

Some questions for discussion:

- What will transportation systems be like?
- How will people communicate?
- How will houses use space?
- Will homes still have kitchens?
- Will people go to the theatre?
- The country another planet?
- What kind of clothing will be worn?
- Will new sports develop?
- How will the elderly, the sick, and the socially maladjusted be accommodated?

Models for city planning that take into account varying social factors may be created by art students, using a modified Delphi technique to formulate the plan for a Utopian city.

After discussing future cities, students should volunteer their conceptions of housing, government, transportation, and social needs of the future. These responses should be listed on the chalkboard so that students may reach a concensus as to characteristics of future cities.

Assessment Measures

Using small blocks of materials to work out preliminary ideas, students can develop a drawing, model, or map of their future city, pointing out both the advantages and limitations.

Some students may have sufficient time to provide drawings of special features such as the transportation system, the methods of food distribution, recreational centers, schools, or housing.

Working in groups, students may produce a mural or a three-dimensional conceptualization of a future city.

References

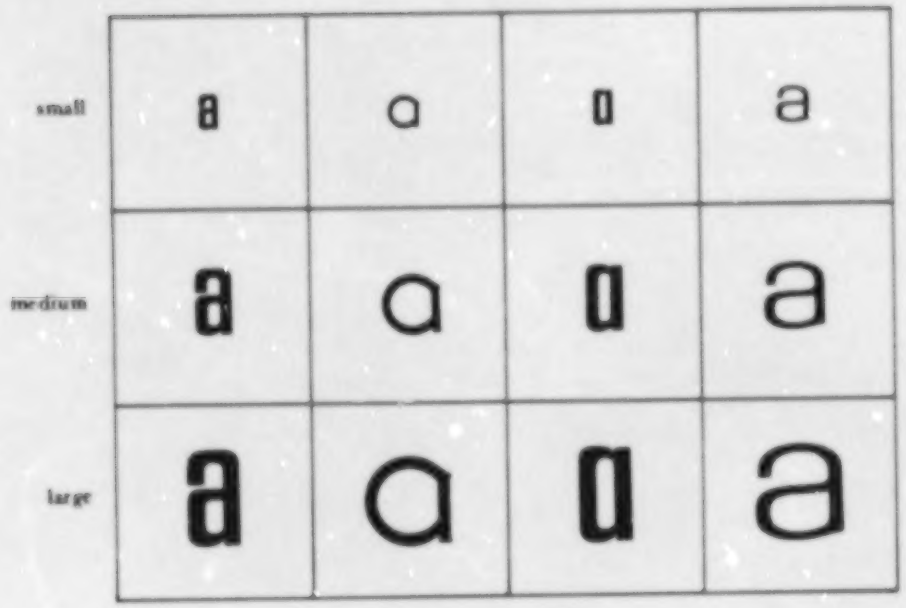
Cook, Peter. *Archigram.*
Fuller, Buckminster. *Operating Manual for Spaceship Earth.*
Hellman, Hal. *The City in the World of the Future.*
Jencks, Charles. *Architecture 2000: Predictions and Methods.*
Munzer, Martha E. *Planning Our Town.*
Newman, Oscar. *Defensible Space.*
Wilson, Forrest. *City Planning: Games of Human Settlement.*

MCPS Films:

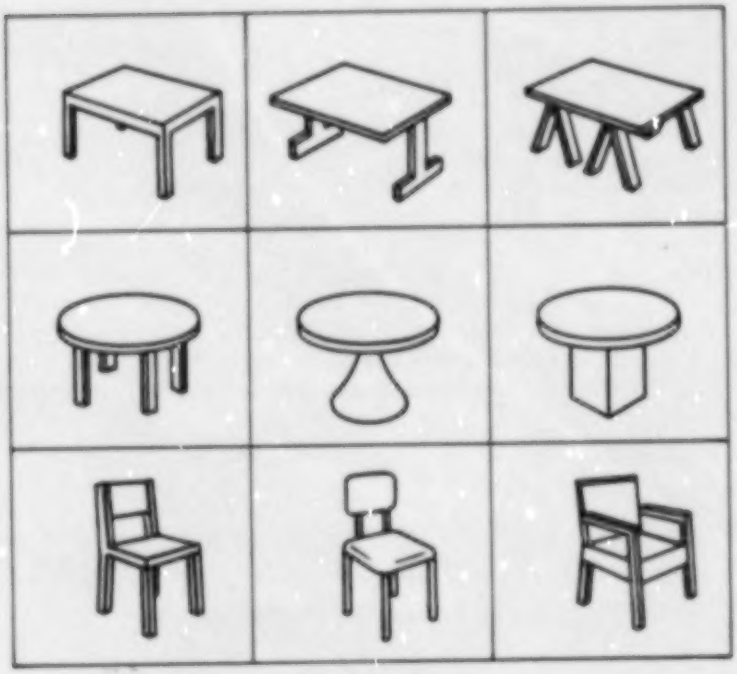
F-4523 *Cities and History: Changing the City*
F-4768 *How To Look at a City*
F-5156 *The Cities: To Build the Future*

APPENDIX A
Sample Matrices

TYPE – STYLES & SIZES



FURNITURE



Appendix B

Food Shopping Activity Plan of a Person Living in an Urban High-rise Apartment

- Makes shopping list
- Organizes shopping cart or bags
- Arranges for child care*
- Goes into hall and locks door to the apartment
- Rides downstairs in elevator, or uses stairway
- Rides bus, or drives car to market
- Walks across streets, stepping up and down curbs

or

- Rides bus after waiting for it

or

- Drives car, parks in lot, becomes pedestrian
- Traverses supermarket; fills cart; has purchases checked out at counter; pays for purchases
- Wheels cart out of store and brings car to loading area; or (2) carries bundles to bus, holds bundles on lap, gets on and off and up and down steps; or (3) carries bundles in arms or uses cart while walking home
- Pushes or pulls open door to main entry; negotiates bundles through door
- Rides elevator or uses stairway, carrying bundles
- Puts down bundles to unlock apartment door
- Puts bundles in kitchen
- Places contents of bags into appropriate storage area, washing fresh vegetables and wrapping meat
- Folds or discards shopping bags

*or takes child/children shopping

Appendix C

Elements of a Community

Although any short list leaves out some important things about the physical aspects of a community, the five elements below offer a starting point for a closer examination of your community. Many parts of any town do not fit into any of these categories

1. **Paths:** The principal means of moving through a city, paths are important channels of human activity. Much of the way in which we understand a city and its appearances is based on the view from a path.
2. **Edges:** Dividing lines which serve as boundaries, edges may be formed by the geography of a town, by a river or cliff; or they may be built like a highway or steep embankment.
3. **Districts:** Clearly identifiable areas which have a common, definable physical character are referred to as districts and may be characterized by common building types or densities or patterns of development. There are often many different kinds of districts in any community, but each distinct district has its own quality.
4. **Nodes:** The areas in a town or city which are important centers into which we enter often are transportation junctions, but their real importance lies in the activity which takes place within them. A town square or corner hangout may be a node.
5. **Landmarks:** These are physical elements which stand out from their setting. Often they are very large — a big neon sign, a church steeple, a distant mountain peak — but they can be as small as a street sign or a special doorknob. The important thing about landmarks is that they stand out and are recognizable.

Appendix D

City/County Planning Survey

1. Underline each city or county service person you have observed observed — police, trash collectors, fire fighters, road construction crews, street cleaners, gas or water line repair persons, telephone or electrical repair persons, crossing guards, tree trimmers. Name some others you have observed. _____

_____

2. Underline each problem you have observed outdoors — speeding cars, overloaded trash containers, holes in streets, trash or litter on streets or curbs, or no sidewalk. Name others you have observed. _____

_____

3. Underline the kinds of surfaces on which you walked to school — sidewalk, street, lawn, dirt path, brick or stone walk, bridge. Name other kinds of surfaces. _____

_____

4. List the streets along which you walk or ride to school. Name as many as you can in any order.

_____

5. If you pass a park on the way to school, check the things that it contains:

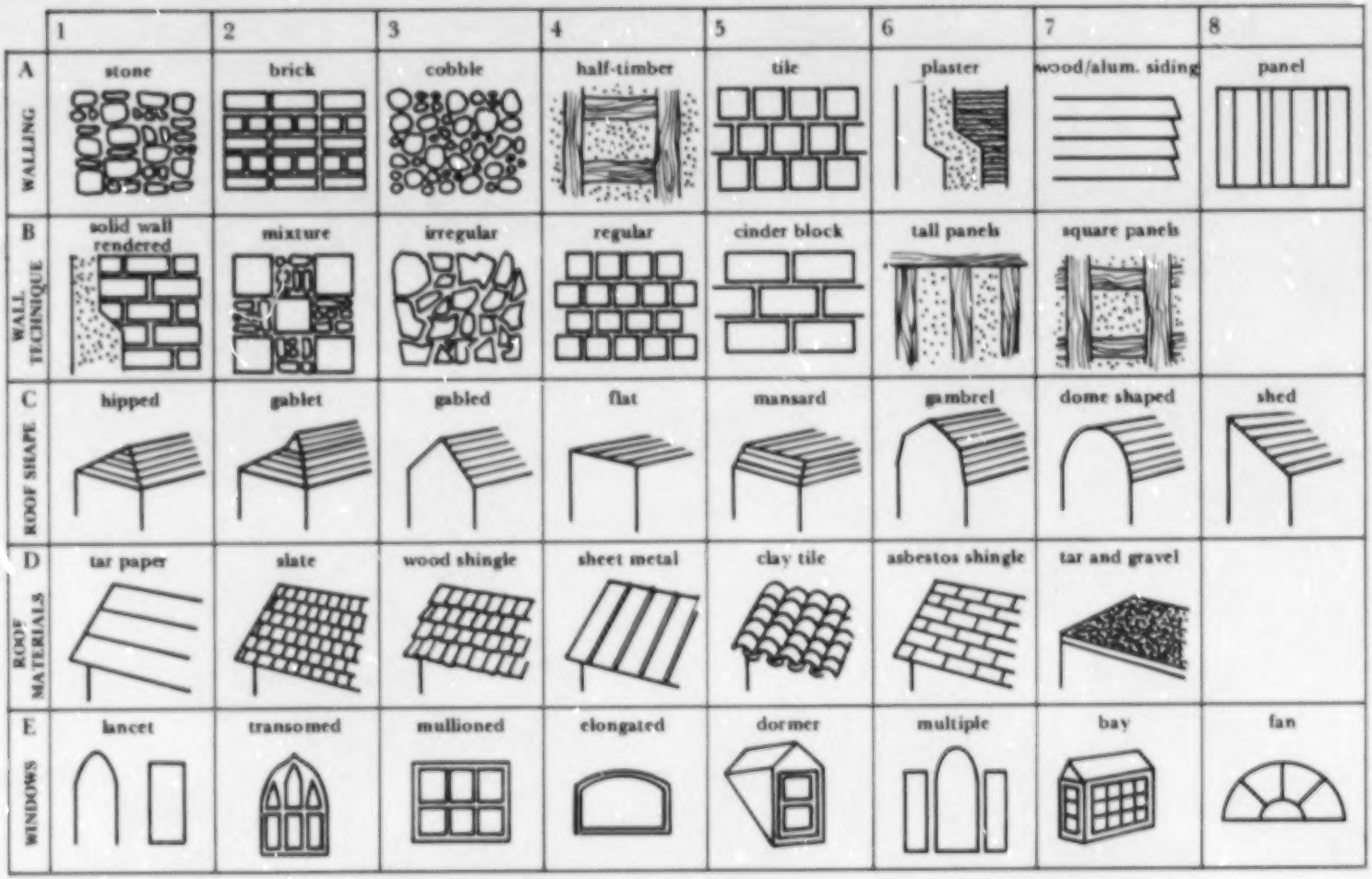
__ playground equipment
__ picnic tables
__ baseball field
__ tennis court
__ basketball court
__ soccer field
__ other equipment _____

6. Underline the kind of unbuilt space you pass on the way to school — vacant lot, park, parking lot, field, pond or lake, forest, farm, playground, or garden. Name any other kind of unbuilt space. _____

_____

7. List the kinds of businesses you pass on the way to school. Group these according to whether they are located in a shopping center, along the street, in a house, or in an office building.

_____



Example of the kind of chart that can be used to code architectural elements and details.

Appendix F

Market Research Survey

(sample)

Knowledge of consumer preferences for certain products and styles guide us in providing the kinds of products and services our community needs. Please check your own responses below:

Male ☐ Female ☐

Age: 12-14 ☐ 15-20 ☐ 21-25 ☐ 26-30 ☐ over 30 ☐

Your hair color: Brown ☐ Blonde ☐ Red ☐ Black ☐ Grey ☐

Your skin color: Fair ☐ Medium ☐ Dark ☐

Your favorite clothing color: Red ☐ Orange ☐ Yellow ☐ Green ☐ White ☐
Blue ☐ Purple ☐ Grey ☐ Black ☐

Do you wear prescription glasses? Yes ☐ No ☐

Do you wear prescription sunglasses? Yes ☐ No ☐

How often do you wear sunglassee? Everday ☐ Sometimes ☐ Never ☐

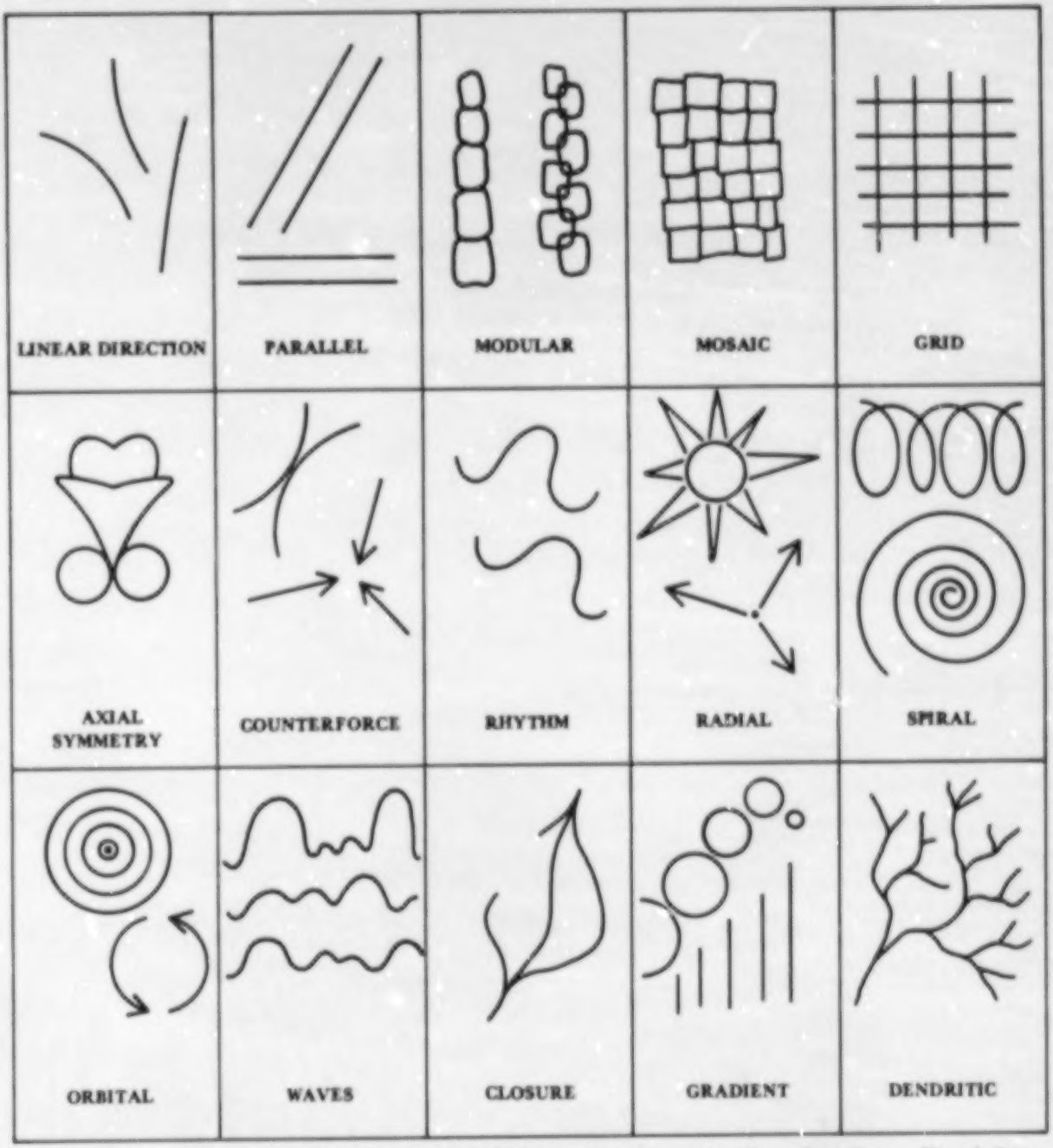
How many pair do you own? One ☐ Two ☐ Three or more ☐

What shade of lens do you prefer? Amber ☐ Yellow ☐ Green ☐ Rose ☐ Brown ☐ Blue ☐

What kind of frame do you prefer? Thick ☐ Thin ☐ Metal ☐ Plastic ☐ Bold designs ☐
Simple designs ☐ Bright colors ☐ Soft colors ☐

APPENDIX G

Most Phenomena Can Be Explained In These Basic Structures

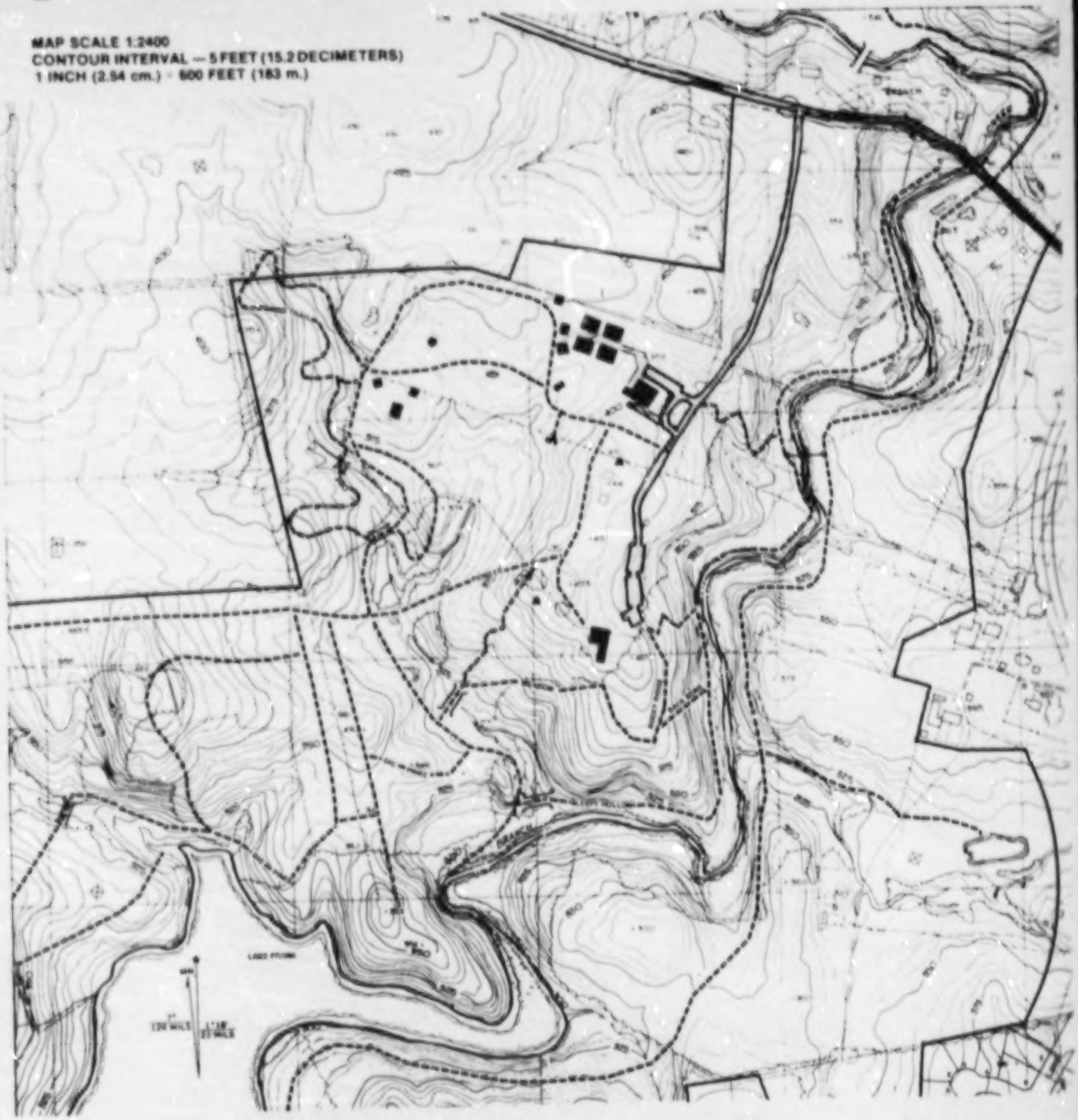


Developed by Attleboro School Department, Attleboro, Massachusetts. "Interdisciplinary Visual Arts in Learning." Don Brigham, 1969, Title III ESEA Grant #67-2809.

ROCK CREEK REGIONAL PARK
MONTGOMERY COUNTY, MARYLAND
CONSERVATION AND EDUCATION AREA

LATHROP E. SMITH
ENVIRONMENTAL EDUCATION CENTER

MEADOWSIDE NATURE CENTER



Annotated Bibliography*

T Allan, Marjorie. *Planning for Play.* Cambridge, Mass.: The MIT Press, 1969. O.P.

Explores play opportunities as developed in several countries. Gives basic needs of children to be met in play areas and examines varying answers. A readable and sensitive text, well documented with concrete examples and carefully chosen photographs. Excellent aid in organizing space primarily for children's activities.

T Allen, Edward. *How Buildings Work: The Natural Order of Architecture.* New York: Oxford University Press, 1980.

Each chapter describes one aspect of building function, such as temperature, fire protection, and structural behavior.

S Anderson, Arthur D. *A Designer's Notebook.* Bloomington, Ill.: McKnight and McKnight, 1966. O.P.

For the student of industrial design. Refers to the elements and principles of art and the design process. States that design must fit into the environment, accomplish a purpose, fulfill a need, and solve a problem.

S *Athletic Field and Court Diagrams.* Wilson Goods Co., 2233 West Street, River Grove, Illinois 60171. O.P.

Standard dimensions and layouts for sports areas.

S Atkin, William W. *Architectural Presentation Techniques.* New York: Van Nostrand Reinhold, 1976.

Includes presentations ranging from simple sketches in pencil or pen and ink to elaborate drawings, photographs, slide presentations, and various combinations of media to be achieved with overlays, camera techniques, and modern reproduction methods.

S Bevlin, Marjorie E. *Design Through Discovery.* New York: Holt, Rinehart and Winston, 1977.

The author reviews design in 15 types of visual expression including fine arts, crafts, commercial art, and architecture. Her purpose is to reveal that design is not a product manufactured by humans but a natural development related to the universe. Discusses formal elements of organization found in nature and applied to objects and art forms.

S ———. *Design Through Discovery: Brief Edition.* New York: Holt, Rinehart and Winston, 1980.

An updated and condensed version of the earlier edition, this presents several approaches for motivating students to explore their environments.

T Biren, Faber. *Light, Color, and Environment.* New York: Van Nostrand Reinhold, O.P.

A review of the biological, visual, and psychological aspects of color. Presents color specifications recommended for office, schools, industrial plants, and houses.

T Breckenfeld, Gurney. *Columbia and the New Cities.* New York: Ives Washburn, Inc., 1971. O.P.

The story of the new city movement as it first began in Europe and is now underway in the United States. Delves into early new towns in America, discusses Lake Havasu City, and concludes with four chapters on Columbia, Maryland. Sparsely illustrated with black-and-white photographs.

S Burns, Jim. *Arthropods: New Design Futures.* New York: Praeger, 1972. O.P.

More than 30 shows by groups of environmental designers, with an informed text commenting on their intent to ease the human situation in an increasingly desensitized atmosphere and gain control of the environment. Amply illustrated in black-and-white photographs and diagrams.

T Chermayeff, Ivan, and Wurman, Richard Saul. *The Design Necessity.* Cambridge, Mass.: The MIT Press, 1973. O.P.

A casebook of federally-initiated projects in visual communication, interiors, industrial design, architecture, and landscape environment. Illustrated with black-and-white photographs.

T Clark, Gilbert, and Zimmerman, Enid. *Art/Design: Communicating Visually.* Blauvelt, New York: Art Education, Inc., 1978.

Includes well illustrated units on graphic design, product design, and environmental design.

T Clouston, Brian (ed.). *Landscape Design with Plants.* Philadelphia: International Ideas, Inc., 1977.

A comprehensive manual which considers the theoretical as well as the practical aspects of landscape design.

*T = for Teacher use
S = for Student use

S Cook, Peter, ed. *Archigram.* New York: Praeger, 1973. O.P.

A fanciful and stimulating view of the future with emphasis on its visual aspects. The ideas and drawings in this book were produced during the 1960's by a team of young British architects.

S Crockett, James Underwood. *Landscape Gardening.* New York: Time-Life Books, 1971.

Discusses the design of yards and gardens for play and work. Includes an illustrated encyclopedia of selected plants for landscaping.

T Croney, John. *Anthropometrics.* New York: Van Nonstrand Reinhold Co., Inc., O.P.

Relating human physical measurements to the designing of furniture, industrial machines, etc.

S Dalzell, W. R. *Architecture.* New York: Van Nostrand Reinhold Co., Inc., O.P.

From methods and materials used in architecture, this book proceeds to a discussion of the types of buildings that best utilize those methods and materials. Amply illustrated in color. A good beginning book of architecture.

S Dreyfus, Henry, and Fuller, R. Buckminster (eds.). *Symbol Sourcebook: An Authoritative Guide to International Graphic Symbols.* New York: McGraw-Hill Co., 1972.

This dictionary contains over 200 pages of internationally-recognized symbols. Includes sections on basic shapes, colors, and graphic forms.

T *Energy Primer: Solar, Water, Wind, and Biofuels.* Menlo Park, Calif.

A comprehensive reference book on alternate forms of energy: solar, water, wind, and biofuels.

T Eriksen, Aase. *Learning About the Built Environment.* Arlington, Va.: National Association of School Principals, 1974. O.P.

An annotated list of teacher guides, films, games, and resource centers with addresses and prices for each item.

T Evans, Helen Marie. *Man the Designer.* New York: The Macmillan Company, 1973.

Contains descriptions of the basic elements and principles of design, discussions of selected designers from all over the world, treatment by the various designers of materials, examples of the use of functional and decorative design principles on objects encountered daily; includes the elements of light and motion and descriptions by designers of their personal philosophies in their approach to design. Well illustrated with photographs.

T Ewen, Stuart. *Captains of Consciousness.* New York: McGraw-Hill, 1976.

An historical analysis of advertising as social production and the political ideology of consumption.

S Farb, Peter, and the editors of Time-Life Books. *The Insects.* New York: Time-Life Books, 1962.

A comprehensive book on insects. Discusses the evolution of the species and the life cycles. Illustrated with many beautiful photographs in full color.

T Forman, H. Chandlee. *Maryland Architecture: A Short History from 1634 Through the Civil War.* Cambridge, Md. Tidewater Publications. 1968.

This concise history presents architectural styles, their development, and sources.

S Friendly, Natalie. *Miraculous Web: The Balance of Life.* Englewood Cliffs, N.J.: Prentice-Hall, n.d.

Describes how animals and people are affected by the places in which they live.

S Frisch, Karl von, and Frisch, Otto von. *Animal Architecture.* New York: Harcourt Brace Jovanovich, 1976.

Profusely-illustrated, well-written book on the types and uses of structures built by animals. Essential text when teaching source of design in nature.

S Froham, Louis H., and Elliot, Jean. *A Pictorial Guide to American Gardens.* New York: Crown Publishers, 1960. O.P.

A guide to famous gardens in the United States, grouped by region.

S Fukuda, Kazuhiko. *Japanese Stone Gardens: How To Make and Enjoy Them.* Rutland, Vt.: C. Tuttle Co., 1971.

Part One illustrates several categories of stone gardens with large illustrations and brief notes. Part Two describes the techniques for building various components of a garden.

S Fuller, R. Buckminster. *Operating Manual for Spaceship Earth.* New York: Books, 1973.

A succinct summary of the thinking of this futurist/architect. His illusory language and complex message make demands on the intellect in this short work in which he considers the planet Earth as a traveling spaceship.

T Gendusa, Sam. *Building Playground Sculpture and Homes.* Dayton, Ohio: Master Press, 1974.

Illustrates many ways of developing student concepts and skills related to environmental sculpture.

T Gillon, Edmund V. *Cut and Assemble Victorian Houses.* New York: Dover Publications, 1979.

Four full-color Victorian-style houses may be assembled in HO scale from this paperback book.

T *Guide to Public Gardens.* New York: Garden Clubs of America, 1976.

State-by-state list of all the larger — and many smaller — public gardens in the United States.

S Guyler, Vivian V. *Design in Nature.* Worcester, Mass.: Davis Publishing Co., 1970.

Relates to the natural sources of decorative design.

S Halsted, Byron D. (ed.). *Barns, Sheds, and Outbuildings.*

Information and 257 illustrations on the placement, design, and construction of farm buildings. A reprint of an 1881 publication.

S Hancocks, David. *Animals and Architecture: The Study of Buildings for Animals.* New York: Beekman, 1971.

This book is about zoos. It presents a survey of the development of animal displays and discusses zoological park design as a means toward educating people about nature while providing humane living spaces for animals.

T Haynes, Robert Ed. (ed.). *Historic Preservation Bibliography.* Washington, D.C.: Superintendent of Documents, 1979.

This 28-page bibliography provides a guide to information about American historic, architectural, and archeological resources.

S Helfman, Elizabeth S. *Signs and Symbols Around the World.* New York: Lothrop, Lee and Shepard, 1967.

This book concerns signs and symbols from picture writing, numbers, symbols in religion, signs for science and industry, to signs and symbols for today and tomorrow. Well illustrated with black-and-white drawings.

T Helman, Hal. *The City in the World of the Future.* New York: M. Evans, 1970.

Excellent book on building and planning cities. Deals with projected future needs and future materials. Discusses university cities, experimental cities, and megastructures as well as "Cities of the Sea."

S Hiller, Carl. *Babylon to Brasilia. The Challenge of City Planning.* Boston: Little, Brown and Co., 1972.

A photographic essay on the problems facing cities around the world and some solutions to those problems. An appendix lists schools which offer a bachelor's program and two-year professional programs in city planning.

S Hohauser, Sanford. *Architectural and Interior Models.* New York: Van Nostrand Reinhold, 1970.

The most comprehensive text on the subject of model making, complete with information on tools, their use, materials, supplies, suppliers, and price lists. The author, a professional, covers all facets of models from the most simple to the most complex through an easily understood text, diagrams, charts, and a wealth of illustrations.

T Holland, Laurence B. *Who Designs America.* Garden City, New York: Anchor Books, Doubleday & Co., 1966. O.P.

A collection of papers presented to the American Civilization Conference at Princeton. First five papers explore problems faced by professionals who need to define standards for good design in our world — to discover the basis of order and value that should govern the arts of design.

S Horn, George F. *Visual Communication.* Worcester, Mass.: Davis Publishing Co., 1973. O.P.

A simple guide for producing visuals.

S Horning, Clarence P. *Horning's Handbook of Designs and Devices*. New York: Dover Publications, 1959. (paperback) O.P.

Excellent source book in design.

S *How To See*. Washington, D.C.: Superintendent of Documents, 1973 (Department of Health, Education, and Welfare).

A small paperback which is designed to help government offices develop better visual communications.

T Hurwitz, Elizabeth Adams. *Design, A Search for Essentials*. Scranton, Pa.: International Textbook Company, 1967. O.P.

States the proposition that man's idea of beauty is derived from nature's forms. All the things that have been made for daily needs have counterparts in nature; human beings have invented no new and different structural principles. Illustrated with black-and-white photographs.

S Jacobsen, Hugh (ed.) and American Institute of Architects. *A Guide to the Architecture of Washington, D.C.* New York: Praeger, 1965. O.P.

Photographs of all the major public and commercial buildings in Washington, arranged in order of a series of walking tours.

S Janke, Rolf. *Architectural Models*. New York: Praeger. O.P.

Environmental design and architectural structures are studied through the construction of models.

S Jencks, Charles. *Architecture 2000: Predictions and Methods*. New York: Praeger, 1971. O.P.

The trends, both social and technological, which will determine the future development of architecture. This book relates recent futuristic proposals to specific technologies, discusses political trends, and maintains a good balance between emphasis on ideas and on hardware.

S Jones, Ron. *Your City Has Been Kidnapped*. Menlo Park, Calif.: Addison-Wesley, 1972.

An informally designed booklet which describes ways to become more aware of one's community.

S Kaufman, Edgar, Jr. *Introduction to Modern Design*. New York: Arno Press, for the Museum of Modern Art, 1969. O.P.

An effective book, well-written and briefly stated. Handles questions of design simply and head on. Effectively illustrated with photographs of interiors and single works in black-and-white.

S Kelly, J. Frederick. *Early Domestic Architecture of Connecticut*. New York: Dover Publications, 1924.

Over 4000 photographs, details, floor plans of the early homes of Connecticut.

S Kepes, Gyorgy (ed.). *Module, Proportion, Symmetry, Rhythm*. New York: George Braziller, 1966.

Four essays are written on the scientific structure of the modular concepts in architecture, the plastic arts, and music. The architect reviews the role of the module in historical building style, discusses the contemporary reassertion of modular design, and presents a case study in a key problem of modular coordination in mass production. The artists reveal the possibilities for structural solutions obtainable from the fundamental elements of line, shape, tone, and rhythm. Illustrations of nature and human-made objects are very good.

T ———. *The Man-Made Object*. New York: George Braziller, 1966.

Presents a general evaluation of the human-made object as an important environmental factor in the shaping of our 20th century mores, feelings, and values.

T ———. *Sign, Image and Symbol*. New York: George Braziller, 1966.

Twenty essays on communication through the use of symbols.

T Kicklighter, Clois E. *Architecture: Residential Drawing and Design*. South Holland, Ill.: Goodheart-Wilcox Co., 1973.

A comprehensive introduction to the field of residential architecture with chapters on planning, design, and presentation drawing. A chapter on roof design will be particularly useful in developing a bus shelter design.

T Krany, Steward, and Fisher, Robert. *The Design Continuum.* New York: Van Nostrand Reinhold, 1966. O.P.

An excellent book to study the visual sequence of design in nature and in human-made objects. The visual forms have been established as painting and other two-dimensional media, textured surfaces, reliefs, monolithic mass, planner forms, and three-dimensional and linear forms. Well illustrated with black-and-white photographs (some color) of objects in nature and human-made objects.

S Lehner, Ernst. *Symbols, Signs and Signets.* New York: Dover Publications, Inc., 1950. (paperback)

An excellent source book for design.

S Lindbeck, John R. *Designing Today's Manufactured Products.* Bloomington, Ill.: McKnight and McKnight, 1972.

A complete reference book that includes some design history, theory of design, materials, and processes and resources.

T McHarg, Ian L. *Design with Nature.* Garden City, N.Y.: The Natural History Press, 1971.

A knowledge-laden book on ecological design which advocates human cooperation and biological partnership with nature. Gets into some technical aspects of ecology but is basically readable. Well-designed book. Well illustrated with photographs, diagrams, and charts.

T McQuade, Walter (ed.). *Cities Fit To Live In.* New York: Macmillan, 1971.

A book for thinking about cities. Divided into sections on Problems, Plans, and Issues, the book is a collection of recent articles on the urban environment. Includes "Urban Violence and Contemporary Defensive Cities" by Robert Gold; "Planning and Using Resurrection City" by John Wiebenson; and "The Political Collapse of a Playground" by Mayer Spirjack. Illustrated with black-and-white photographs.

S Macaulay, David. *Underground.* Boston: Houghton Mifflin, 1976.

A visual impression of the various support systems such as sewers, foundations, and utilities that lie beneath our buildings and streets.

S Martin George A. *Fences, Gates and Bridges.* Brattleboro, Vt.: Stephen Green Press, 1974.

Describes dozens of types of fences along with wickets, gates, stiles, hedges, small bridges, and culverts.

T *Maryland Outdoor Recreation and Open Space Concept Plan.* Maryland Department of State Planning, State Office Building, Baltimore, Maryland, 1970.

A statement of policy, long-range and general, to provide guidelines for making decisions in government and private enterprise about recreation and open space.

T Masson, Georgina. *Dumbarton Oaks: A Guide to the Gardens.* Washington, D.C.: Dumbarton Oaks, 1968. O.P.

A preview of the grounds.

T Middleton, Michael. *Group Practice for Design.* New York: George Braziller, Inc., O.P.

Includes strategies for group participation in environmental design, architectural design, interior design, and theatre and film production.

T Moholy-Nagy, Laszlo. *Vision in Motion.* Chicago, Ill.: Paul Theobald Co., 1947.

Concentrates on the work of the Chicago Institute of Design by students and faculty. Presents a broad general view of the interrelatedness of art and life. Good black-and-white reproductions.

S Munser, Martha E. *Planning Our Town.* Alfred A. Knopf, 1964. O.P.

A clear, readable text on the subject of human communities and the forces that act on and unite them. The book deals with problems of planning urban renewal, water supplies, air pollution control, land use, transportation, and problems of regional planning. Well organized and nicely illustrated with black-and-white photographs.

T Newman, Oscar. *Defensible Space: Crime Prevention Through Urban Design.* New York: Macmillan, 1973.

Presents a system of design criteria for urban housing based on an analysis of problems in existing environments.

S Papanek, Victor. *Design for the Real World: Human Ecology and Social Change*. New York: Random House, 1971.

An industrial designer, Papanek takes his own profession to task for having misdirected its efforts -- providing more attractive merchandise for the affluent consumer, rather than seeking design solutions that will benefit the greater and more deserving populations of under-developed countries.

S Papanek, Victor, and Hennessey, James. *Nomadic Furniture One*. New York: Pantheon, 1973.

Every page illustrates a household item of furniture that was designed to be portable because it can be assembled easily and taken apart. Some pieces also consist of recycled materials while others are intended to be disposable.

S *Planning Facilities for Athletics, Physical Education, and Recreation*. Chicago: The Athletic Institute, 1974.

This is a book of standards and regulations which gives the layout and dimensions for physical activity facilities. Ball fields, courts, and gymnastic equipment are described in detail.

S Plowden, David. *The Hand of Man on America*.

This book of photographs makes a visual comment on the face of America. It portrays, in fine photography, the ways in which our landscape has been used and abused.

T Preservation Press. *Preservation: Toward an Ethic in the 1980's*. Washington, D.C.: The Preservation Press, 1980.

A review of the National Preservation Conference held in Williamsburg in 1979. Discusses where preservation is heading and where it should go.

S Rowland, Kurt. *Pattern and Shape*. New York: Van Nostrand Reinhold, 1964. O.P.

This first volume of a series on looking and seeing compares natural and human-made forms.

S Rutledge, Albert. *Anatomy of a Park: The Essentials of Recreation Area Design*. New York: McGraw-Hill, 1971.

The essentials of recreation area planning and design.

S Schinneller, James A. *Art/Search and Self-Discovery*. (2nd ed.) Scranton, Pa.: International Textbook Co., 1975. O.P.

An approved textbook, this large volume deals with the characteristics and scope of the visual arts encompassing both past and present. Each chapter focuses on an art form rather than on a chronological survey. Numerous photos and diagrams contribute to the easy reading text.

S Smith, Whitney. *Flags Through the Ages and Across the World*. New York: McGraw-Hill Book Co., 1975.

A major survey of civilization from the perspective of flags and other international symbols.

T Snyder, J.C., and Catanese, A. J. (eds.). *Introduction to Architecture*. New York: McGraw-Hill, 1979.

This broad perspective on architecture traces its origin and history as well as its response to culture, climate, geography, technology, and materials.

T Sommer, Robert. *Personal Space: The Behavioral Basis of Design*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

A social scientist analyzes human behavior as it relates to the design professions.

S Stevens, Peter S. *Patterns in Nature*. Boston: Little, Brown and Co., 1974.

Hundreds of photographs, drawings, and comments about the structures in nature.

T Suckle, Abby (ed.) *By Their Own Design*. New York: Watson-Guptill, 1980.

Ten internationally known architects describe the process of designing and constructing one of their major buildings.

S Thompson, Elisabeth (ed.). *Recycling Buildings: Renovations, Remodelings, Restorations, and Reuses.* New York: McGraw-Hill, 1977.
Mainly photographs of examples of structures that fit the title.

T Walker, Lester, and Milstein, Jeffrey. *Designing Houses: An Illustrated Guide.* Woodstock, N.Y.: Overlook Press, 1976.
A step-by-step guide to planning and designing a house. Written in layman's terms.

S Whiffin, Marcus. *American Architecture since 1780. A Guide to Styles.* Cambridge, Mass.: MIT Press, 1969.
Concise guide to the history and identification of American styles from Colonial to Brutalism.

T Wilson, Forrest. *Architecture and Interior Environment: A Book of Projects for Young Adults.* Cincinnati, Ohio: Van Nostrand Reinhold Company, 1972.
Describes simple classroom projects that can lead to a better understanding of structural principles, scale, space, and environment.

S ———. *Architecture, A Book of Projects for Young Adults.* New York: Van Nostrand Reinhold, 1968. O.P.
This small text describes the more commonly used architectural and engineering systems with simple, practical suggestions for demonstrating each system.

T ———. *Built Environment: A Teacher Introduction to Environmental Education.* Washington, D.C.: American Institute of Architects, 1975.
This booklet offers environmental activities for the lower grades, and lists resources.

S ———. *City Planning: A Book of Games for Young Adults.* New York: Van Nostrand Reinhold, 1975.
An illustrated guide to understanding city planning through a variety of fascinating games.

T ———. *What It Feels Like To Be a Building.* Garden City, N.Y.: Doubleday, 1969. O.P.
A visual book which illustrates structural principles analogous to human forms and shows examples of their use in architecture and the world.

T Wolk, D. *Visionary Cities: The Arcology of Paolo Soleri.* New York: Praeger, 1972.
Highly imaginative use of black on white and back lighting for unusual graphic layout and typography.

S *The World Book Encyclopedia.* Chicago: Field Enterprises Educational Corp., 1977.

S Wurman, Richard Saul. *Making the City Observable.* Cambridge, Mass.: MIT Press, 1971.
This special issue of the periodical *Design Quarterly* is a catalog of projects, ideas, books, guides, maps, and curriculum on the environment.

S ———. *The Nature of Recreation: A Handbook in Honor of Frederick Law Olmsted.* Cambridge, Mass.: MIT Press, 1972.
Helps the reader understand his own recreational needs and preferences.

Related Pamphlets

Background Readings Related to Architecture and the Built Environment. Philadelphia Chapter, American Institute of Architects.

Architects Building, 17th and Sansom Streets, Philadelphia, Pennsylvania.

Bell, Given, and others. *Urban Environment and Human Behavior.* Stroudsburg, Pa.: Dowden, Hutchinson and Ross, Inc., 1973.

Books as presented in three categories: Design Approaches, Social Studies Approaches, and The Framework to Urban Environment.

Built Environment: Environmental Education Teaching Tools, American Institute of Architects, Washington, D.C.

An annotated list of useful books, programs, and films

Eriksen, Aase. *Learning About the Built Environment,* National Association of Elementary Principals, 1801 N. Moore Street, Arlington, Virgina 22209.

A comprehensive list of teachers guides, background materials, complete programs or units and mini-courses, films, games, resource centers

National Trust for Historic Preservation. *Films: Historic Preservation and Related Subjects.* Washington, D.C.: Preservation Press, 1976. NTHP, 740-748 Jackson Place NW., Washington, D.C. 20006.

National Trust Preservation Bookshop Catalogue, National Trust for Historic Preservation Bookshop, 740 Jackson Place, NW., Washington, D.C. 20006.

Lists books on historically significant architecture, preservation, restoration, surveys, federal programs

Articles in Periodicals

Ackerman, James S. "Listening to Architecture." *Harvard Educational Review* 39:4-10 Fall 1969.

A manner of interpreting the language of a building. What scale, material, and site communicate to the listener.

Adams, Eileen. "Opening Many Doors." *The Times Educational Supplement* 3184:20-1 June 11, 1976.

A report of a two-year experiment designed to create a greater awareness of the built environment and tested at the Pimlico School in London. The program reaches children at six different age levels, and begins with familiarizing them with neighborhood buildings. They later focus attention on streets, shops, social issues, and local history.

Berkeley, Ellen Perry. "Environmental Education from Kindergarten on Up." *Architectural Forum 130:46+* June 1969.

A report of courses and projects dealing with architecture and environmental awareness in the schools.

Carter, Doris Marie. "Annihilating Environmental Anesthesia." *Art Education* 28:2-5 February 1975.

A course outline with a suggested list of readings designed to make "Mr. Citizen of 1981" more perceptually attuned to his environment. Included are topics on street furniture, conservation, and reconstruction.

Chalmers, F. Graeme. "Teaching Environmental Design." *School and Community* 58:38 February 1972.

Suggestions for an inter-disciplinary approach to community study using the art class as well as the social studies class. Students can produce a set of slides and a super 8mm movie showing community values, or they can design models for a needed elementary school playground.

Christopher, David. "Travel Guide to Theme Parks." *Instructor* 87:163-168 February 1978.

Descriptions of major theme parks throughout the country. Addresses and phone numbers are included.

Danzer, Gerald. "Buildings as Sources: Architecture and the Social Studies." *The High School Journal* 57:204-13, February 1974.

Danzer explains the manner in which architecture is related to social studies prior to giving a 10-step guide (in outline form) to looking at a building.

Dibner, David R. "Opening Their Eyes to Architecture." *AIA Journal* 60:48 October 1973.

An architect visits a classroom, bringing with him a cardboard box filled with materials he uses. Following his visit, students design and construct a building model.

Eriksen, Aase. "Learning About the Built Environment." *National Elementary Principal* 55:36-41 March 1976.

A report on some materials and activities available nationwide to teachers who wish to instill in children an appreciation for the built environment

Friedman, Herbert H. "Spatializing the Concept of a Neighborhood." *The Journal of Geography* 67:79-81 February 1968.

Beginning with an inquiry into the meaning of the word *neighborhood*, a seventh grade class in Manhattan embarks in a map project to record movement within a selected area. The students record their own daily movements to delineate a neighborhood region.

Heisner Report. "Terraset: A School with Energy for the Future and for Tomorrow." *Instructor* 87:16-20 November 1977.

A description of the unique underground elementary school in Fairfax, Virginia, which is heated with solar energy

Kliment, Stephen A. "Architecture: 1776 and 1976 — Two Reflections of Values." *Social Education* 40:26-8 January 1976.

An historical approach to the study of architecture. Architecture in the two eras is compared using the lifestyles of the people as a point of reference.

Kraft, Frank J. "We Live in an Octagonal Prism." *School Arts* 75:22-3 June 1976.

A course outline of an eighth grade approach to architecture. Students in Oswego, New York construct models, go on walking tours, and write research papers on historical architecture.

Lewis, Phyllis A. "Chipboard Houses." *School Arts* 74:44-6 April 1975.

A 10-week project in which students design and construct Victorian houses using chipboard. Presentation periods using slides and magazine pictures are followed by preliminary sketches the students draw prior to the actual cutting of the walls.

Libby, Thomas J. "Architecture — Easy Bridge to Aesthetic Education." *School Arts* 72:24-6 April 1973.

Merrick, Wayne R. "Architecture." *School Arts* 73:22-3, April 1974.

A project in which students create three-dimensional architectural forms using pre-cut cardboard shapes after reviewing the film *A is for Architecture*.

Nalle, Leona. "Looking At the Streets Where We Live." *School Arts* 74:26-7 April 1975.

Ninth grade arts students make an 8mm film documenting traffic and pedestrian flow at intersections of major streets in their community. After field trips to see successful pedestrian malls, students draw up plans to humanize their city and give pedestrians the right of way.

———. "Enriching the Local Environment." *School Arts* 72:22-3 April 1973.

Ninth grade art students draw plans and construct scale models redesigning the environment around their school. Their suggested uses of lighting fixtures, benches, and low plantings could serve as inspiration to some administrators.

Noble, Allen G. "Evolution and Classification of Nineteenth Century Housing in Ohio." *The Journal of Geography* 74:285-302 May 1975.

Using Ohio as a basis for study, settlement landscape patterns and architectural styles are discussed. Evolution of house styles from European models is mentioned.

Ryan, Mary. "Toledo, Ohio Public School Children Help Plan Toledo's Maumee Riverfront Development." *School Arts* 74:36-7 June 1975.

At the suggestion of Toledo's Vice-Mayor, students from kindergarten through high school design art projects with ideas of how to develop the Maumee riverfront. Several of their ideas will be incorporated into the final design.

Suather, Arnold. "Bring Architecture Home." *School Arts* 68:14-15 March 1969.

An architecture unit focusing on the local area. In addition to studying particular notable buildings, the students explore the function and beauty of homes in general.

Shannon, Joseph. "The Art Teacher: Environmental Advocate." *Art Education* 23:28-31 May 1970.

A framework for art teachers who wish to change the attitudes responsible for the present environmental blight. These are teaching strategies, not projects or teaching aids.

Surridge, O. J. "EAHY: What the Schools Are Doing." *The Times Educational Supplement* 3133:64 June 13, 1975.

A report of some of the ongoing school projects taking place in England as part of the European Architectural Heritage Year. Students are restoring landscaped gardens, making photographic records of villages, and studying ancient manor houses.

Villecco, Marguerite. "Architecture as Energy." *Design Quarterly* 103, Minneapolis: Walker Art Center, 1977.

This issue is devoted to architecture that utilizes solar and wind energy.

Wilson, Forrest. "Teaching the Built Environment." *School Review* 82:680-6 August 1974.

General methods for teaching about the built environment, using graphics and model building and capitalizing on familiar visual experiences.

Wright, M. Frank. "An Increased Awareness of Our Environment." *School Arts* 71:36-7 March 1972.

A major project designed to give students an increased awareness of their surroundings. They first sketch a map from memory showing how to get from their homes to school including landmarks they see along the way. This map is later revised as the students carry it with them and make additions along the route.

Wurman, Richard Saul, and Killinger, Scott. "Visual Information Systems," *Architecture Canada*, March 1967. (160 Eglinton Avenue, E., Toronto 12, Ontario.)

A survey of the state of the art several years prior to publication.

from *Art and Man*

"The City" Vol. 1, No. 7, 1971
"The Master Builders" Vol. 7, No. 1, October 1976
"The Shakers" Vol. 2, No. 5, February 1972

Periodicals

Architectural Digest
P.O. Box 2415
Boulder, Colorado 80332

Art Direction Magazine
Advertising Trade Pub., Inc.
19 West 44th Street
New York, New York 10036

Art in America
Subscriber Service Division
542 Pacific Avenue
Marion, Ohio 43302

The BEEC Report
Built Environment Ed. Center
P.O. Box 13507
Philadelphia, Pennsylvania 19101

Communication Arts Magazine
P.O. Box 10300
200 California Avenue
Palo Alto, California 94303

Craft Horizons
American Crafts Council
16 East 52 Street
New York, New York 10022

Graphis Annual
Walter Herdez Graphis Press
45 Nuschelerstr 8001
Zurich, Switerland

Illustration
Art Instruction School
Minneapolis, Minnesota

Industrial Design
One Astor Plaza
New York, New York 10036

Interior Design
150 East 58th Street
New York, New York 10022

Landscape Architecture
1190 East Broadway
Louisville, Kentucky 40204

Packaging Design
1028 Connecticut Ave., NW.
Washington, D.C. 20036

Parks and Recreation
National Recreation and Park Association
1601 North Kent Street
Arlington, Virginia 22209

Progressive Architecture
P.O. Box 95759
Cleveland, Ohio 44010

School Arts (April 1975, April 1978)
50 Portland Street
Worcester, Mass. 01608

Note: Materials listed in bibliographies above must be approved by MCPS before use in classrooms. Observe MCPS Evaluation and Selection policies.

See MCPS list of approved periodicals.